REPORT RESUMES

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NEEDED RESEARCH IN THE TEACHING OF ENGLISH, PROCEEDINGS OF A PROJECT ENGLISH RESEARCH CONFERENCE (CARNEGIE INSTITUTE OF TECHNOLOGY, MAY 5-7, 1962).

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CONTAINED IN THIS MONOGRAPH ARE PAPERS PRESENTED AND SUMMARIES OF DISCUSSIONS HELD AT THE MAY 1962 PROJECT ENGLISH RESEARCH CONFERENCE ON NEEDED RESEARCH IN THE TEACHING OF ENGLISH. TOPICS COVERED ARE (1) RESEARCH GAPS IN THE TEACHING OF ENGLISH ON THE ELEMENTARY, SECONDARY, AND COLLEGE LEVELS, (2) NEEDED "MULTILEVEL" RESEARCH IN ENGLISH, (3) LANGUAGE STUDY IN ENGLISH TEACHING, (4) PSYCHOLOGICAL MEASUREMENT, (5) PROBLEMS IN CONTROLLED RESEARCH, (6) ENGLISH-TEACHING INNOVATIONS, (7) COMPUTER MODELS OF PSYCHOLOGICAL PROCESSES, (8) IMPLICATIONS OF PROJECT TALENT FOR RESEARCH IN THE TEACHING OF ENGLISH, AND (9) THE IMPORTANCE OF THE CONFERENCE TO PROJECT ENGLISH. AUTHORS OF CONFERENCE ADDRESSES ARE DWIGHT L. BURTON, PAUL B. DIEDERICH, JOHN S. DIEKHOFF, JOHN C. FLANAGAN, GARLIE A. FOREHAND, W.N. FRANCIS, J.N. HOOK, W.J. MCKEACHIE, WALTER R. REITMAN, JAMES R. SQUIRE, AND RUTH G. STRICKLAND. THIS MONOGRAPH IS AVAILABLE, FOR $0.55, FROM THE SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON 25, D.C. (RD)

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Needed Research in the Teaching of English

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Office of Education

NEEDED RESEARCH IN THE TEACHING OF ENGLISH

TE 000 192

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Cooperative Research
Monograph No. 11

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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Needed Research in the Teaching of English

Proceedings of a Project English Research Conference
May 5-7, 1962

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U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
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Foreword

THIS MONOGRAPH is being issued in response to widespread concern for improving English instruction in our schools and colleges. It is particularly intended for the use of research specialists and educators in the fields of English and English education.

The appropriation of limited funds in 1961 for the establishment of *Project English* demonstrated Congressional recognition that improved teaching and learning of English is of nationwide importance. In order to develop guidelines for an effective program, a conference on *Needed Research in the Teaching of English* was held at Carnegie Institute of Technology in the spring of 1962. The participants included scholars and teachers, psychologists, administrators, and representatives of educational organizations concerned with the teaching of English at all levels of the educational scale. The proceedings of this conference are published here. They have been edited and forwarded to the Cooperative Research Branch by Erwin R. Steinberg, who was general chairman of the conference.

This is one of three types of monographs in the Cooperative Research series. It is designed to assist in the development, stimulation, and understanding of specific educational research problems. A second type includes the findings of a final report or part of a final report of one research project sponsored by the Cooperative Research Program. The third type provides information from several final reports that focus on a particular problem in education.

RALPH C. M. FLYNT
Associate Commissioner for
Educational Research and Development

FRANCIS A. J. IANNI
Director, Cooperative Research Branch

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Part I: Introduction

IN RECENT YEARS the Federal Government has developed several programs to promote and support research and curriculum development in the teaching of the sciences and the foreign languages. The most important of these have operated under the National Science Foundation and the National Defense Education Act. In the fall of 1961, the advent of Project English marked the beginning of a similar program to improve the teaching of English. Since Project English is discussed in some detail in the first paper in this report, we need say here only that it envisaged, in the words of its coordinator, Dr. J. N. Hook, "supporting basic and applied research studies, research planning and development, and a few curriculum study centers."

With the possibility, under the aegis of Project English, of an organized effort to improve the teaching of English at all levels, it became imperative to bring together leaders in the field to develop guidelines for the directions the program might take. In the spring of 1962, therefore, a conference was planned which would bring together scholars and teachers of the English language, writing, reading, and literature; specialists in the teaching of English; psychologists; school administrators; and representatives of various responsible educational organizations.

The conference was held at Carnegie Institute of Technology on May 5, 6, and 7, 1962 with Project English support. Its objectives were to—

1. Isolate the most pressing research problems in the teaching of English at all levels.
2. Assign priorities to them.
3. Describe both applicable research procedures and necessary criteria.

The task presented to the conferees, therefore, was to pull together the thinking and scattered research in the teaching of English, determine the gaps, and point the way for further significant research.

Fortunately, some of the necessary sifting had already been undertaken. A series of Basic Issues Conferences, supported by funds from the Ford Foundation, had been held under the sponsorship of four major professional organizations in English—the American Studies Association, the College English Association, the Modern

Language Association, and the National Council of Teachers of English. These organizations distributed the report of the conferences, *The Basic Issues in the Teaching of English*, to their members in the fall of 1959. In 1961, the National Council of Teachers of English issued *The National Interest and the Teaching of English*, a report on the state of English teaching in this country. The National Council for Research in English and the National Council of Teachers of English have also issued monographs summarizing research findings and discussing needed research. Many who attended the conference on *Needed Research in the Teaching of English* at Carnegie Institute of Technology, therefore, came with a good understanding of the needs they were to discuss.

The program for the conference included eleven papers, two general sessions, and the following four concurrent discussion groups:

1. **Research in the Teaching of the Elementary School Language Arts**
2. **Research in the Teaching of Secondary School English**
3. **Research in the Teaching of College English**
4. **"Multilevel" Research in the Teaching of English**

Each discussion group met for a total of 7 hours during the 3-day conference. The eleven papers presented and summaries of the discussions of the four groups are included in this report. Material from the discussions in the two general sessions appears in the introduction to the summaries and in the conclusion.

Amid the profusion of questions raised at the conference and the flood of recommended research, some of the conferees, understandably, began to feel that nothing was known about the teaching of English, that, as one conferee put it, "it is all gap." The reader of this report, unless forewarned, may feel the same. Actually, much is known about the teaching of language, literature, and composition. Teaching, as a profession, goes back several thousand years, and the experiences and, more recently, the research accumulated during that time have been widely published. That there are many excellent teachers of English at all levels is attested to by the differing preparations of the students who enter the colleges and graduate schools. The fact that some of them are clearly better prepared than others of equal potential indicates both the importance and the existence of good teaching. What is more, discerning residents in any community are very much aware of who the good teachers are. One need not be a research specialist to discover good teachers; one need only be a student.

The many questions and recommended research projects, therefore, do not indicate a lack of knowledge. Sometimes they indicate a desire to buttress an art with science, to analyze and define the techniques of the skillful English teacher and the contents and patterns of good English courses and curriculums. With more exact knowledge available, colleges will be better able to prepare prospective teachers, and administrators and interested citizens will with more confidence be able to distinguish the better from the poorer programs.

One final note should be added. Discussions at the conference were long, often loud, and sometimes even hot. The informal sessions that carried on for many hours after the close of the formal program the first two evenings were similarly intense. But with it all, academician disagreed with academician and educationist with educationist as often as academician with educationist; administrator disagreed with administrator and teacher with teacher as often as administrator with teacher; psychologist disagreed with psychologist and subject-matter specialist with subject-matter specialist as often as psychologist with subject-matter specialist. Communication among the practitioners of the various specialties represented at the conference was clearly not only possible but also profitable. Everyone—sometimes to his admitted surprise—learned from everyone else. And if each person left the conference less sure about some of the ideas he had held earlier, he also left convinced that many of the important questions about what to teach in the English classroom and how best to teach English were answerable and that there were competent and committed people who were interested in pooling their skills and knowledge with his to obtain those answers.

The papers given at the conference were designed to serve both as springboards for discussion for the four discussion groups and as sources of information on needed research for the conferees and for the readers of these proceedings. The first paper is introductory. It explains Project English and the function of the conference. The remaining ten papers divide into two groups according to their function and the professional interests and training of their authors.

The authors of the first five are specialists in English and English education. Each was asked to report on needed research in a particular aspect of the teaching of English. The approach of the first three of these papers is horizontal. They deal with needed research at the various levels: elementary school, secondary school, and college. The approach of the fourth paper is vertical. It deals with matters of common concern at all levels and with such problems as articulation and longitudinal studies.

The approach of the fifth paper, on language, is also vertical. The inclusion in the conference of a paper on language without parallel papers on literature and composition reflects the profession's growing interest in the last 10 or 12 years in structural linguistics and generative grammar research and the implications of that research for the teaching of English. The new grammarians have not only supplied a vast new body of subject matter, but have also challenged a significant portion of what English teachers have done in the past. It seems clear that further research in language and attempts by the profession to assimilate it will be featured prominently in the journals and at meetings for many years to come. Nothing since the advent of the new criticism has been so influential in causing the members of the profession to reexamine what they have been doing. Such innovations, coming as they do about once a generation, are probably the best possible protection against the profession's "heavily thickening to empire." (Project English, hopefully, will serve in the same capacity.)

The authors of the last five papers are psychologists or specialists in testing. The first two of these papers deal with methodology of research in teaching. The next two describe continuing research projects. They serve not only as examples for the two relatively more theoretical papers which precede them, but also as sources of problems for further research. The final paper provides a glimpse into the future. It is a "blue sky" attempt to foretell how the computer may help us discover not only more about how people learn, but also, more about how they learn and use language.

Part II: The Papers

The Importance of the Conference to Project English

J. N. Hook
Coordinator of Project English
U.S. Office of Education

WHEN Sterling M. McMurrin became Commissioner of Education in 1961, one of his first acts was to urge Congress to support an attempt to improve the teaching and learning of English. In testimony in April, 1961, he said:

> We are convinced that more adequate instruction in the schools in reading and in the written and oral usage of the English language is a matter of utmost importance among our national needs.

In early autumn 1961, Congress made available under Public Law 531 a limited amount of money to begin what is designated as Project English. Guided by a small informal conference of professional leaders, representatives of the Office of Education made preliminary plans for supporting basic and applied research studies, research planning and development, and a few curriculum study centers. At meetings of the National Council of Teachers of English, the Modern Language Association, and the College English Association in November and December 1961, announcements concerning Project English were made, and representatives of the Office met individually with about two hundred persons who wanted information about the project.

At the end of January 1962, I became coordinator of Project English, to serve during its formative stages. It has been my responsibility to coordinate the presently authorized facets of the Project, and it has been my pleasure to work with numerous individuals and groups, both within and outside the Office, on long-range planning.

I shall first make a few remarks about hopes and then conclude with some statements about present activities, of which this conference is one.

There are in English four major areas of need in which the Federal Government may legitimately and profitably complement the activities of local school districts, State departments of education, colleges and universities, and professional organizations. I use the word *complement* because it is neither the intent nor the desire of the Office of Education to direct such activities; in fact, the pertinent Acts introduced in the Congress contain paragraphs explicitly prohibiting the use of Federal funds for such a purpose.

For three of the four areas there is at present no Congressional authorization in English, although there are programs in these three areas for improving the teaching of foreign languages, science, and mathematics. Legislation now pending would make possible an extension of these programs from these subjects to English.

One need is for the strengthening of presently employed teachers of English in the elementary schools, secondary schools, and colleges. The major emphasis here would be upon summer institutes, year-long institutes, and increased numbers of extension courses or inservice institutes. Special scholarships or fellowships for highly qualified teachers would also be involved, as would special seminars for college teachers. Institutes are particularly useful in enhancing teachers' knowledge of subject matter, as the experience of science, mathematics, and foreign languages has shown; since the majority of elementary teachers have studied little English in college and since about half of the secondary teachers of English do not have English majors, the deficiency in subject-matter preparation is acute. Institutes have the further advantage, however, of being capable of flexible arrangement so that whatever the most pressing needs of a given teacher are, those needs may often be met in large measure.

A second area of need is in the recruitment and preparation of future teachers. *The National Interest and the Teaching of English*, published in 1961 by the National Council of Teachers of English, pointed out the growing shortage of qualified English teachers on all levels. Through the production of effective films and television programs and through such a program as that of the Visiting Scholars in mathematics, the Federal Government could aid materially in recruitment. Through encouragement of able liberal arts graduates to earn a master's degree in the teaching of their major subject, additional recruits could be obtained. In teacher preparation, Federal support could make possible a conference or conferences for the purpose of establishing patterns for ideal undergraduate and graduate programs, could stimulate various pilot programs, and could encourage the States to look anew at their certification requirements.

The third area of need is in dissemination of information about the fine things already going on in some classrooms. In the modern mass media we have untapped opportunities to call to the attention of the profession and the public the excellent teaching that does occur in hundreds of classrooms. Both inexperienced and experienced teachers can profit if we rely upon media in addition to journals and monographs to demonstrate how successful teachers effect their successes.

The three segments of Project English I have so far described are in the realm of hopes and dreams—realizable and precedented hopes and dreams. The fourth area, research, is already being Federally supported and is what this conference is about.

Later this month the Research Advisory Committee, required by Congress to be composed of persons outside the Office of Education, will weigh the merits of some 40 research proposals in various phases of English—proposals that have resulted from the publicity so far given the project. About a dozen other studies, some of them started before the initiation of Project English, are already underway. Three curriculum study centers, each established for 4 to 5 years and costing up to $250,000 in Federal funds in addition to local money, are getting started. An invitational conference in English for the culturally disadvantaged is scheduled for later this month. Proposals for several other conferences have reached the Office.

Letters of support for Project English come to the Office daily. State departments of education are making such comments as "the most refreshing news to come our way in a long time." Well over a hundred chairmen of college departments of English, acting largely upon a letter from the Modern Language Association, have expressed a desire to work beside their colleagues in education on research, institutes, or the like. Professional organizations both inside and outside the National Education Association have sent inquiries or offered suggestions.

The conference that is now opening affords an opportunity to channel such widespread interest in a most productive way. The work outlined for us during the coming 3 days will provide a basis for much of the research and experimentation so seriously needed in the teaching of English.

Specifically, my conception of this conference in relation to the totality of Project English is this: in English teaching we have relied too long on our best guesses. Any of us can ask scores of questions, probably answerable by research, to which sufficient systematic study has not been directed; we have to guess at the answers. Research in English teaching has been, for the most part, shoestring research, inadequately supported financially and carried on either by inexperienced degree candidates or by teachers already heavily burdened by other duties. Money is needed to accomplish the necessary research; so are knowledge of the subject matter of English and knowledge of child psychology, pedagogical principles, and techniques of experimental research. Specialists in education generally lack detailed knowledge of English. Specialists in English generally lack detailed knowledge of child psychology, and other such fields. We need the cooperative effort of the best minds available, regardless of labels, regardless of departmental boundaries, regardless of academic levels. It is highly significant, I believe, that in this conference we have representatives from elementary and secondary schools and colleges, departments of English and education and psychology, State departments of education, organizations of administrators, and several quite different professional organizations. Whatever we can agree upon here will have wide implications and utility for the profession we all serve. More important, it can have extensive influence upon what will go on in classrooms 2 years, 5 years, 10 years, or 20 years in the future.

We are now beginning to get money for research. We are beginning to get assurances of cooperation from people with various labels, in various departments, on all academic levels. To make effective use of that money and that cooperation, we need to develop guidelines. In this conference we shall try to list many of the questions pressing for answers. We shall try to suggest priorities and some of the workable procedures. Those will supply guidelines for future work.

From this conference I envision these results: (1) A brochure summarizing the findings and recommendations, to be distributed widely to colleges, universities, State departments of education, and interested individuals, in order to stimulate the undertaking of the most essential research; (2) several follow-up conferences to work on more detailed recommendations for research in, for example, the teaching of composition, the relation of English to other disciplines, or the role most appropriate for specific groups; and (3) feed-in from this conference to curriculum study centers, institutes, methods and other courses so that many inservice and preservice teachers may become more clearly aware of what we do not know as well as what we know.

When Philip Coombs was with the Ford Foundation, he told a group of New York educators that research in education must concern "that which makes a difference." Both basic and applied research may make a difference, and I hope that here we shall not ignore either. Perhaps during our deliberations we should use as a touchstone for each suggestion the question "Will it make a difference?" If from this conference enough difference-making suggestions are derived, at the end of the third day we can return home well content.

Some Important Research Gaps in the Teaching of the Elementary School Language Arts

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STRONG CURRENTS of loudly voiced public opinion as well as evidence of the thinking psychologists, educators, and scholars in the field of English call attention to a number of areas of elementary school language arts which need improving but about which we actually know relatively little. If we divide the language arts into the four major functions—listening, speaking, reading, and writing—each presents its own areas of reliance on an accumulation of opinion and tradition rather than on a foundation of reliable research.

It is assumed, as the result of observation, that language is learned through listening and association; yet these avenues are little relied on to improve language. As a child listens he acquires more than patterns of sounds which he associates with objects and actions. Listening involves building and dealing with constructs and concepts. But what actually is the mental process of listening? All children develop it in some degree. Good listening demands sensitivity to overtones and undertones as well as to the semantic possibilities of words and probably much else. Could we, if we understood more clearly what listening is, find ways of developing it in greater depth?

Studies of nearly 20 years ago tell us something about the extent of the vocabulary which can be understood and perhaps used by samples of children. Is there a common vocabulary of all children? To what extent do cultural and environmental factors influence not only the acquisition of words but also the connotations attached to words and patterns of word grouping? What determines diversity? Does what children read influence their use of words, orally and in writing? Studies of the words children use in their reading and writing show a large unused vocabulary. Is there any way of tapping this reservoir? Should the school do this as well as add new content to the reservoir?

Children know a great deal of grammar when they come to kindergarten or first grade. It is not abstract, descriptive terminology regarding grammar but actual knowledge of how people in their speech environment put words together into patterns which express meaning. Available research indicates very clearly that what the school teaches about grammar has little or no influence on either speech or writing. Is there something better that we might teach rather than hold tenaciously to what we are now teaching? Children are eager manipulators of language but are little concerned with the labels we attach to the elements they manipulate. Is there material in what the structural linguists have to offer which children can utilize to better understand how to manipulate sound to express meaning? Children appear deeply interested in how elements operate, what one can do with them, and for what ends.

Oral language, the linguists tell us, *is* the language. To what extent is the rest of children's learning of language skills dependent upon the skill with which they use oral language? When a child tells or dictates stories, how do these differ from those he writes? To what extent is his oral reading interpretation related to the maturity of his use of oral language? If these are related, to what extent is the depth of a child's comprehension in silent reading influenced by the quality of oral language he uses? Can he turn what his eyes meet on the page into meaningful, intelligible language patterns? And to what extent is the quality of a child's listening related to the quality of his oral language?

While many critics of the teaching of reading admit that reading is better taught today than it was a generation ago, the need is greater today and the results not good enough. The question of the age at which children *can* begin to learn to read is an unanswered one. A few children learn to read before they come to school. How do they do it? Are values gained or lost by early beginners? New approaches to reading are being suggested which need intensive research, and other possibilities can and must be devised and tested. A language approach to reading which moves logically from known oral symbols to unknown written ones is being tried experimentally. Children are taught to put their own sounds to symbols—a logic quite the reverse of the usual phonics emphasis which goes from unknown symbol to abstract sound and divorces both from meaning. A phonemic approach has appeared in print which follows the logic of the phonic approach but utilizes a different organization of sound elements divorced from meaning. Of what value is this approach? Can the proposed materials be used with groups as well as individuals?

Currently, many reading experts are diametrically opposed to any approach to reading that minimizes meaning because of the difficulty of later teaching children that deciphering and pronouncing words is not reading. True reading cannot be divorced from content and thinking. Yet the materials now used for teaching the beginning stages of reading contain so little of content to think with that we may be deluding ourselves as to the value of what is done with meaning at this stage. It is conceivable that a combination of a language approach to reading and the proposed phonemic approach may have greater value than anything we have yet tried. Both approaches need extensive research on methods, materials, and long-range outcomes.

Good beginnings with reading do not always result in good readers. A reader is a person who reads. We have for generations taught people how to read without doing very much to help them with what to read and for what purposes. Generalized reading skill is not enough. Children in the middle grades need to be taught how to adapt their skill to varying materials and purposes—how to read mathematical problems, scientific content, and materials in the realm of the social sciences as well as how to read literature and the daily newspaper. More research is needed on how best to develop these related skills. Not all of this work can be done in the elementary school. Evidence is needed regarding the responsibility of the secondary school and college for deepening, expanding, and refining the skills germinated in the elementary school.

We hold it to be true that the child builds himself as he builds his language. He builds through language his concepts of himself, of others, of how people behave and why, of life on the earth, and of man's relationship with man. We need to know more about the interrelationship of language and personality, language and ideas and ideals, language and action and interaction. In a world in which we are told that consensus must rapidly take the place of mere consent, we need to know much more than we now know about how mind interacts with mind through language and how understanding and empathy develop between people of all ages. We need to know more about the relationship of what one hears and reads to what one is and does.

If literature helps a child to develop his philosophy of life—what literature? We have heard a great deal of late about the need for a background of literature in the elementary school that will enable the college student to recognize literary allusions in the literature he reads in the college English courses. In this the prime purpose for the teaching of literature in the elementary school? Or should children's literature be taught to widen children's horizons, deepen their understanding, and enable them to enter into their common humanity? If the latter goal is deemed a worthy one, then what kinds of literature provide the best self-building material for children at various ages and stages of development?

How we provide experience with literature appears as important as our choices of the literature to teach. Psychologists and teachers need to work together to determine how attitudes toward literature are developed, lest through lack of understanding and ineptness we turn children from the very literature we want them to love. We need to develop depth of insight into children's reactions that will help us to know when to let literature speak for itself and when to analyze it, when to value a child's reaction to the message above his understanding of form and style.

The teaching of writing bristles with unsolved problems. Writing needs to be recognized as a dialect of language, one which is similar to but different from oral language. Teachers know that many children can compose and dictate a story or report of far better quality than the ones they write. What are the limitations of physical capacity at various ages and among children at any age? What is the effect of early emphasis on spelling, punctuation, and handwriting on the quality of what is written? Do we load too much on the shoulders of children when they are not yet ready to handle simultaneously ideas, the composing of those ideas into sentences, and all the elements of form necessary to good writing? Is there a relationship between the quality of a child's writing and his physical limitations, his lack of clear understanding of content, his inability to visualize matters of form, and his lack of any vital interest in the process of writing? How can we correct any errors of grade placement and pacing to improve our teaching of writing? There are many questions to which psychologists, English teachers, and other researchers can provide answers which will help the elementary teacher.

Underlying all of these problems of teaching is that of the education of the elementary teacher. How much and what should be his work in English during his 4 or 5 years of college? What does he need to know about the English language, its history, its structure, what is happening to the English language and what is happening as the result of it? What literature should he study for his own enrichment and as a background for his teaching of children? What does he need to know about the content of children's literature and how to select and analyze it? How can he learn what good writing is and how people achieve it? What help does he need from psychology and child development in order to reach children, to motivate them, and to help them grow in language power? What help does he require in order to know how to teach reading and all the other facets of the language arts?

Our need in elementary education is not for more statistical compilations to tell us how to do what we are doing. We know something about what children learn of what we attempt to teach them. We know little of what they could learn if we knew how and when to teach it to them. Our need is for reaching beyond what we are now doing, for setting up hypotheses, preparing materials and testing them in a variety of ways. Little of the mass of statistical research that has been done has influenced education. Educational philosophers, psychologists, sociologists, linguists, and teachers need to work together to look beyond some of our present boundaries of content and method. There are many gaps in our knowledge of how children learn their language and what they can learn to do with it.

Some Important Research Gaps in the Teaching of Secondary School English

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Editor, The English Journal

LITTLE THAT WE DO in the English classroom at any level is research-tested, probably, and although some important research in the teaching of English has been done, even some of that remains to be translated into practice. Humanists tend to rely upon intuition, and English teachers, as Howard Mumford Jones once pointed out, are somewhat hostile to research, or at least to certain connotations of the word.

In preparing this paper, I solicited the judgments of several other people experienced in research in the teaching of English at the secondary level. A consensus seems to be that we know in general what the problems are, but we do not know how to attack them effectively. One of my consultants, Margaret J. Earle, of Syracuse University, concluded: "We lack the tools for measuring precisely the changes in which we are most interested." Perhaps, then, my task in *identifying* gaps is relatively easy, though identification of problems is a logical starting point.

"Sequence" and "sequential" are among the most fashionable words in education today. Few speakers or writers on curriculum issues and problems omit these words, and I shall not. A number of curriculum bulletins, some of them gaining wide publicity, have laid out courses of study. Every new textbook series presents a sequence of a sort. Yet the lack of a real research base for a sequential program in English is a primary gap. The sequence outlined in the special supplement to PMLA which contained also the report of the Basic Issues Conferences was entitled "An Articulated English Program: A Hypothesis To Test."[1] This is accurate labeling, and all other proposed programs should be labeled similarly. The sequential or articulated programs proposed so far are for the most part armchair accomplishments. Some of them are worthy armchair accomplishments to be sure, for the armchairs have been occupied frequently by people who bring wide experience and knowledge to the problem. Further, we would agree probably that no research sorcery ever will evolve a leakproof sequential program for all school systems, that some of the decisions will have to depend upon intuition and some upon pure arbitrary choice. Surely, however, a general research base for sequence can be built, and the plans for Project English suggest excitingly that this may be accomplished.

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[1] *PMLA*, LXXIV, Number 4, Part 2, September 1959, p. 13–19.

Individual research and the evaluation of various programs by the curriculum study centers should contribute some answers to such specific questions as: (1) At what levels, intellectually and chronologically, can certain language concepts be introduced profitably? (2) At what levels do students have capability or potential for insights into the nature of literature or for certain types of response to a literary genre? It may be true, as one of my doctoral students assures me, that we know more about the first question than I think we do. A thorough collation of studies may be in order. At any rate, the question can be approached in one way through analyses of the written and oral language of children and adolescents. One such study—an analysis of structures, classified according to traditional grammar, used by children in grades 4 to 12—was published nearly 30 years ago by Lou LaBrant.[2] Unfortunately few similar and improved studies have been made since. Further longitudinal studies of language development will make an important contribution in answering this first question. Two such studies, sponsored by the Office of Education, are already in progress and are well known: one under the direction of Professor Walter Loban at the University of California; the other, under the direction of Professor Ruth Strickland at Indiana University.

The question concerning a possible hierarchy of insights into literature or responses to it poses many problems, of course. In a recent bulletin of the Oakland, California, Public Schools,[3] five stages in what is called "poetry appreciation" are identified: (1) Enjoyment of rhythm, melody, and story; (2) appreciation of seeing one's own experiences mirrored in poetry; (3) projection into a world other than that in which one lives; (4) understanding of symbolism and hidden meanings; (5) sensitivity to patterns of writing and to literary style. Such analyses are important, but they, again, constitute hypotheses to be tested; and such testing will require use of sophisticated and imaginative techniques. Closely related to this latter question is this one, important to the teaching of both composition and literature: At what point on the verbal intelligence scale must we give up hope of developing the concept of form?

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[2] Lou LaBrant, *A Study of Certain Language Developments of Children in Grades IV to XII, Inclusive,* Genetic Psychology Monographs, XIV, November 1933, p. 387–491.

[3] *Find Time for Poetry.* First Progress Report on the Teaching of Poetry. Supplement to *Elementary Curriculum Guide, II,* Grades 3 and 4, 1960.

Turning from this hasty examination of some of the problems connected with establishing a base for sequence in secondary English, I wish to identify three other major gaps. First among these is the need for a fuller answer to the question, "What approaches or methods in rhetoric are most effective in developing skill in written composition?" The problems here lend themselves to relatively straightforward experimental studies, but we have had few of these, probably in part because of the difficulty of reliably measuring effectiveness in writing.

Three directions for research in the relationship between rhetoric and composition might be profitable:

1. What is the effect of direct teaching of elementary logic on effectiveness in written composition? And at what levels of intelligence is such teaching effective? There is, of course, a common assumption that logical thinking and effective written composition are related closely. If so, will direct teaching of logic lead to improved written composition? There is again a common assumption that it will. For example, Professor Albert Kitzhaber points out the importance of logic in both of the composition courses developed by the Commission on English of the College Entrance Examination Board. One unit in the first course, he says, "concludes with a study of the uses of logic in persuasion."[4] And about one unit in the second course, he says, "Included in this unit is some consideration of the elements of logic as they bear on the organization of expository prose."[5] In the admirable volume entitled *Essays on the Teaching of English*,[6] a collection of papers read at the annual conferences on English at Yale University, two of the four essays on the teaching of expository writing stress the importance of elementary principles of logic.

2. What is the contribution to growing effectiveness in writing of student analysis of the expository prose written by experts? The Commission on English again assumes a direct relationship, for Professor Kitzhaber reports that analysis either of short passages or complete essays is an important part of the composition courses developed

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[4] Albert R. Kitzhaber, "New Perspectives on Teaching Composition," *College English*, XXIII, March 1962, p. 442.

[5] Ibid., p. 442.

[6] Edward J. Gordon and Edward S. Noyes, eds. *Essays on the Teaching of English*, New York: Appleton-Century-Crofts, 1960.

for the Commission Institutes.[7] Tentative results from a study carried out in a high school in Sudbury, Massachusetts, under a grant from the Fund for the Advancement of Education, indicate that quantity of reading contributes more importantly to improvement of written composition than amount of practice in writing, especially among able students.[8]

3. What is the relationship of phonology and oral patterns of language to development of skill in written composition? Why faults in writing are not paralleled by faults in the speech of the same student puzzles us. Part of the explanation is clear: various signals of stress, pitch, and juncture are present in the oral language constructions which are often not available in writing. But there is more to it. How can the student be led to translate these signals clearly into this somewhat artificial dialect which is the written language? So far the linguists themselves have gone not much further than to relate phonology to punctuation. This general problem led the President of the National Council of Teachers of English, G. R. Carlsen, to assert recently that "it seems apparent that improvement in writing can be best accomplished by increased practice in the control of oral forms of language,"[9] and a number of articles have appeared under such titles as "The Oral Approach to Sentence Sense."[10] Some studies have shown the value of oral drill and practice in usage over written, but the problem of the relationship of effective sentence construction to oral signals also needs study.

Growing out of the question concerning methods or approaches in teaching written composition is one concerning *conditions* under which writing ability develops most effectively. Specifically, how much criticized practice in writing do students need at different grade levels and at different levels of intelligence in order to make optimum progress in writing? I realize how loaded, in a research sense, is this question. Many of us have rallied to the shibboleth of the theme a week. Yet serious doubts on this assumption are cast by at least one recent study in a New England High School, a study in which the data are "chancy" but provocative.[11] In this study there was no difference in growth between students who wrote for criticism once a week and those who wrote once every three weeks. Other studies, testing the effects of frequencies of writing, are progressing. The amount of practice necessary to improve written composition is of great importance to the high school teacher who normally teaches five classes of students per day. Important, too, is a related problem: What kind of evaluation is most effective with what students? Books on the teaching of high school English have been most explicit on the best type of evaluation of student writing, but the research basis for these recommendations seems missing. Certain studies have dealt with the relative effect of praise and blame, for example, but a central problem remains: Given the context of high school English teaching, what is the system of evaluation of composition by which the teacher can communicate most efficiently to the students? One small-scale study sponsored under Project English, which I am in the throes of directing, is now underway to study the effects of different amounts of practice and different types of evaluation, and the interaction of the two, among tenth-grade students.

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[7] Kitzhaber, op. cit., p. 440–444.

[8] Frank Heys, Jr., "The Theme-A-Week Assumption: A Report of an Experiment," *The English Journal*, LI, May 1962, p. 320–22.

[9] G. R. Carlsen, "Teaching on the Edge of Discovery," *Educational Leadership*, XIX, February 1962, p. 288.

[10] E.g., Julius S. Rosenson, "The Oral Approach to Sentence Sense," *The English Journal*, XLVII, October 1958, p. 425–30.

[11] Heys, op. cit., p. 320–22.

Finally, a research gap in secondary English exists in an old battle area—the relation of direct teaching of language structure to ability in oral and written expression. To be sure, studies in this field have shown a tenuous connection between knowledge of traditional grammatical terminology or ability to analyze sentences grammatically, through diagrams or other techniques, and ability to write clear and correct sentences. Numerous studies have yielded low correlations between scores on grammar or usage tests and ratings on themes. But many are not convinced that the data are all in, and the average high school English teacher doggedly pursues the notion that in teaching grammar he is contributing to the student's ability to write and speak the language. The many-headed problem remains: In what ways and with what students does what type of analysis of English sentences affect writing or speaking? Many linguists have assured us that a study of the structure of English is a liberal study in itself that need not necessarily have anything to do with practical effects on expression. But high school teachers and school systems have remained a bit uneasy with this rationale for expenditure of time in a cramped curriculum. Lurking behind lip service to the liberating effects of the study of language is the kind of assumption epitomized in this statement about the Portland, Oregon, course of study by the supervisor of English in the Portland schools: "While language study is included in the curriculum because it is a significant humanistic subject for which English teachers must accept the responsibility for instruction, it is expected that the instruction will also have beneficial practical effects. Since speaking and writing will depend constantly upon choice, the knowledge of what the choices are and what their effects might be will help students toward better linguistic expression."[12]

At the last meeting of the Conference on College Composition and Communication, Noam Chomsky, the leader of the generative grammarians, posited the significance of aims and explicitness as the two general criteria for judging the effectiveness of a grammar. Traditional grammar rates high on significance of aims and low on explicitness, said Chomsky; but with structural linguistics, he said, it is the other way around—high on explicitness, low on significance of aims. Presumably, generative grammar rates high on both, but its effectiveness in leading students to generate sentences in the full variety of English syntax remains to be tested. A few experimental studies, mostly short term, have compared the effects of structural linguistics and traditional grammar. Results are inconclusive. Apparently students like the structural approach better, probably because it is something new about which the teacher is enthusiastic. No difference in effect on writing, however, has been demonstrated. Professor Ralph B. Long assures us, and attempts to demonstrate in a recent book,[13] that traditional grammar as a means to better sentence construction is not dead. Not only must we test with greater precision and sophistication the contribution of various grammars to better expression, but we must also consider the problem of what grammar, if any, students of lower verbal ability can learn at all. One study shows that students in the lower 50 percent in verbal intelligence cannot learn effectively the traditional Latinate grammar.[14]

(And let us now merely nod humbly and parenthetically, with an eye on the clock, toward the possible connections between linguistic analysis and improvement of reading ability and perception of form in literature!)

In this brief discussion, my sins of omission may be more egregious than my sins of commission. For example, I have been overzealous perhaps in preventing my interest in literature from influencing my assignment of priorities to research problems. Whatever your judgment of my sins, I think that most of us will not agree with Mortimer Smith's comment on Project English in the *Bulletin of the Council for Basic Education* that we already have too much research to digest and that the danger of further research is that we may discover that we need even more of it! I doubt that we share this fear. Instead, I think we are troubled by a realization of how much we now do *not* know. But let us at the same time not dismiss what we *do* now know. Research in the teaching of English is not a new undertaking. I am at the moment engaged in an examination of 33 unpublished doctoral dissertations on the teaching of English written since 1956. Surely there are more. But among these 33 are the long and the short and the tall. Too many are rather poorly planned surveys. The experimental studies are in the minority and some of them are of too short a term to be taken seriously or are plagued by an imponderable "Hawthorne effect." But good scholarship is represented, too, and we can take advantage of it as we accelerate and improve our research efforts. Our major overall need is for experimental studies imaginatively designed and rigorously controlled, studies in which the sensitivity and imagination of the humanist is wedded to the precision and insight of the psychometrician and his computer. At such a wedding we will sound the march to answers we so earnestly seek.

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[12] Marian Zollinger, "Language Study in High School English Classes," *The English Leaflet*, I, Midwinter 1962, p. 48.

[13] Ralph Long, *The Sentence and Its Parts*, Chicago: University of Chicago Press, 1961.

[14] Richard A. Meade, "Who Can Learn Grammar?" *The English Journal*, L, February 1961, p. 87–92.

Some Important Research Gaps in the Teaching of College English

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MOST PEOPLE who teach English in colleges and universities are oriented toward research. It is research (perhaps more often called "scholarship") in English, however. Research in teaching we are likely to regard as unnecessary or fruitless or as outside our responsibility.

Perhaps we define it too narrowly. We might be more sympathetic to it if we regarded the art of teaching as another field of scholarship. If we define *research* broadly as a deliberate, systematic attempt to find out what we need to know, ought to know, or desire to know, we will discover not only that teaching is an area of research but also that we have done some of it.

We have done a good deal. A great many college and university English departments and a great many individual members of them have undertaken what we call "experiments" in the teaching of English. *College English*, the *Journal of Higher Education*, the *Journal of General Education*, the *CEA Critic*, *College Composition and Communication*, and other journals occasionally carry reports of these "experiments." Indeed, almost the entire March issue of *College English* is devoted to problems of teaching English, and the articles that constitute it fit my general definition of research even though they do not describe "experiments."

When we do perform experiments, however, I wish they were better designed. When I was a second-year instructor in English at Oberlin, my colleague Kenneth Williams and I, in our youthful naiveté and enthusiasm, devised a before and after test of "the appreciation of poetry." We made the mistake of telling the dean about it before and therefore had to tell him after. He included it in his annual report to the president. The sentence he devoted to it read, "Mr. Diekhoff and Mr. Williams conducted an interesting pedagogical experiment without results."

I also wish that we were more interested in research about teaching. When I was at another institution, the English Department went through the usual debate about the efficacy of freshman composition, and I proposed to my colleagues that a hundred entering freshmen, chosen at random, be exempted from freshman English and that outside examiners be retained to see whether in their senior year the exempted students could be distinguished from their classmates who had had the course. My colleagues declined the challenge.

I proposed another experiment. In the college in which I was teaching, freshman composition classes were limited to 18 students and we tried to keep them to 16. Because of conferences and theme-reading, the instructor received 5 hours of teaching credit for a 3-hour freshman composition course. A neighboring college with comparable students limited freshman composition classes to 30 students and the instructor received only 3 hours of teaching credit. The department in the second college kept pointing to my college as a model, protesting that it could not itself do a good job with the workload involved. The administration at my college was inclined to wonder (not always silently) why it cost more than twice as much to teach freshman English as in its sister institution. I proposed that we employ outside examiners to see what difference there was in the quality of student writing in the two colleges. Neither department would take the risk, and I gave up what I regarded as "research" and "experiment" in the teaching of English. I wish I could say that I began to think about it instead, but I'm afraid that that is only a half-truth.

One of our troubles, I think, is that when we undertake what we call research in the *teaching* of English, we become empirical; and we are not empiricists. We try to devise controlled scientific experiments, with interesting null hypotheses, in which we will gather data for elaborate statistical analyses; but we are neither scientists nor statisticians and are not trained in the techniques of such experiments. And we are either too smug or too ignorant to call for the collaboration of colleagues in education and in psychology who do know those techniques and the principles that underlie them.

This is the first point I should like to make, I think. We cannot undertake the job alone. We need help from other experts. A year ago, Professor Jerome Bruner published *The Process of Education* (Cambridge, Mass., 1961), a report on a 1959 conference on education in science in primary and secondary schools. In spite of being a conference report, it may well prove to be a seminal book in education. Most of the illustrations are drawn from science, however, and I for one do not have enough understanding of psychology nor imagination enough to apply the principles of Professor Bruner's book to the teaching of English. But if we in English will work with Professor Bruner and his like, between us I am sure we can initiate a revolution in the teaching of English comparable to that which (I hope and am assured) is taking place in biology, chemistry, mathematics, and physics. I am not sure I know how to teach English, in college or anywhere else. The only thing I am sure of is that there must be a better way.

First we must ourselves learn some psychology—enough to be intelligent collaborators. Then we must not merely welcome but must invite collaboration by our colleagues in education and psychology. Among us, we may be able to devise a curriculum and revise our teaching to enable students earlier to apprehend the structure of our discipline or disciplines, so that they will understand better—have a context into which they can fit new learning, a set of principles they can apply to new particulars, and an understanding that lessens the gap between "elementary" and "advanced" knowledge which always plagues our teaching. Among us, working together, we may be able to relate our English curriculum to the typical capacities of children and youth of different ages and differing abilities, so that the curriculum in English will not ignore the principles of continuity and development that are apparently so important to progressive learning. The purpose of a university education, Whitehead says somewhere, is to shed details in favor of principles. But it cannot work unless the principles are understood, and Professor Bruner makes the important point that early understanding of the structure of a discipline and of its fundamental principles is basic to continued progressive learning and to meaningful memory of particulars. Again and again we must define the basic structure and the fundamental principles of our disciplines and determine how to communicate understanding of them to beginning students.

Surely it will be reassuring to teachers of English to be told by a distinguished psychologist of the importance of intuitive understanding and to find him in this context drawing his illustrations not only from science and mathematics but also from the practice of poets and critics. Learning from and with our psychological friends, perhaps teachers of English can help with the psychological research needed. Perhaps in our discipline, better than in others, psychologists can learn how intuition works and can make the application not only to the teaching of English but to the teaching of other subjects as well.

Finally, perhaps we can learn from and with our friends in education and psychology how to make some of the compromises between the demands of our subject and the interests and motives of our students—compromises that will encourage learning.

I suggest then that among the areas of needed research in the teaching of college English are some problems in which we must collaborate with colleagues in psychology and education. How can we devise a curriculum or curriculums in English which will better communicate the structure and principles rather than the mere particulars of our discipline, which will develop and exploit readiness to learn at each level, which will cultivate intuitive as well as analytic understanding of language and literature, which will take advantage from the beginning of the interest in reading, of the desire to read and learn, of the joy of reading, and which will let the joy of reading survive rigorous study of language and literature at the advanced levels of the college and university? These are questions to which we need answers. We need research to answer them.

We cannot do this alone either, nor with the collaboration of colleagues in other parts of the university only. "Research" in the curriculum of the college or in teaching at the college level will be meaningless if we do not learn from and with our colleagues in elementary school and high school. The whole profession must be involved. That representatives of the whole profession are meeting here, as they have met in prior conferences, is a most encouraging recent sign. That we have broken our agenda into discussion of needed research at the several levels of our school system will prove unfortunate if we do not recognize that what we learn about teaching in elementary school and high school has a bearing on what we need to learn about teaching in college.

I have one other point to make. I hope we will not limit our research in the teaching of college English to the techniques in which we ourselves are not expert. We are not experimental scientists by inclination or training. We must not ignore the fact that we have a backlog of professional experience in study and teaching which we can contemplate, about which we can speculate, upon which we should bring to bear what wisdom we have. I hope we will not mistrust our own intuitive insights into our subject and into its significance to others. I have mentioned the March 1962 issue of *College English*. It reports a conference of English teachers concerned with the teaching of English. There is a report on the teaching of literature, one on teaching about the English language, and one on the teaching of composition. And then there is a long committee report, and a good one, on the

"Professional Career of the College English Teacher." If the participants in the several groups were preparing for something that might be called experiments, they had not yet performed those experiments. Instead, the first three groups were drawing upon their experience as scholars and teachers of English to formulate programs for summer institutes for secondary school teachers. They did some thinking and some talking, they designated distinguished and able people to report the results of their deliberations, and they produced reports that may also produce results. The group describing the professional career of the English teacher also drew on wide and varied experience of scholarship and teaching, did some thinking, and wrote a report on institutional practices. (They also used a questionnaire, but it did not interfere too much with their thinking and seems to have done no harm!)

If this is not research, it is nevertheless something we should be doing. We should be thinking about literature, language, and writing. We should be thinking about teaching. We should think about English and about teaching at the same time. And we ought to communicate to one another the results of our thinking.

It need not always be in committee. G. B. Harrison's recent book on *The Profession of English*[1] is the delightful autobiography of one of our very distinguished colleagues. In it, a wise, witty, crotchety professor of English reflects on a lifetime of teaching and scholarship and tells us what it is all about. We ought to read it. And the wise and witty among us ought to write things like it, for interested and literate members of the general public for our colleagues in other disciplines, for administrators, trustees, foundations, legislators, and other well-heeled and influential residents of Philistia, and for one another. If what we say and what we do are not the same, if our principles and our practices do not jibe, it is easy to know which we should change. We all know the story of the farmer who rejected advice from the expert from the Agricultural Extension Service. "Sonny," he said, "I ain't farming half as good as I know how right now." We ain't neither.

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[1] George B. Harrison, *The Profession of English*, New York: Harcourt, Brace, and World, 1962.

"Multilevel" Research in English: Imperatives for the Sixties[*]

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MULTILEVEL RESEARCH in English I assume to be research which can affect any and all educational levels, from kindergarten to college. In this paper research is defined broadly and somewhat inconsistently, its dimensions ranging on the one hand from basic studies in the substantive content of English to applied studies in teaching method and program development. Three general kinds of research seem worth discussion: (1) Longitudinal studies of language development, (2) research in articulation and program development, and (3) research basic to all levels of instruction.

In each category I shall discuss significant general problems and suggest some important possibilities.

Longitudinal Studies of Language Development

Despite the profession's persistent interest in language development, despite continuous attempts during the past 15 years to plan curriculums from kindergarten through college,[1] despite the fact that both experience and common sense dictate that the surest way to discover how language develops is to study its emergence and refinement in the usage of boys and girls—we have had few longitudinal studies. During the 30's Lou LaBrant's research in writing and independent reading offered a beginning;[2] Dorothea McCarthy analyzed the language development of children;[3] and a few insights emerged from more general researches into the physical, emotional, and social characteristics of children. In general, however, our knowledge about the growth of language skill and literary appreciation is fragmentary and based either on cross-sectional samplings of young people in differing age-grade groups or on ingenious interpolations piecing together isolated studies of individual acts of learning. We can often tell whether a tenth-grade student can or cannot respond to a poem or whether he does or does not understand the concept of a paragraph, but we do not really know how he has become what he is. Perhaps in no other aspect of English learning is our need for information so great. Ultimately our ability to plan intelligent sequences of instruction must be based on more reliable information about how language abilities develop.

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[1] For example, the Commission on the English Curriculum of the National Council of Teachers of English, appointed in 1946, produced a volume on the total English curriculum in 1952, *The English Language Arts*, Chicago: The Council 1952.

The reasons for the paucity of longitudinal studies are not difficult to determine. To analyze data which can be acquired only over a 12- to 15-year period requires half of the professional career of the primary researcher. Young men, understandably concerned about promotions and the seemingly insatiable demand of our academic culture for quick publication, shy away from longitudinal research which yields important findings only after several years. Indeed, the failure of the overwhelming majority of our researchers in the teaching of English—and in the field of education as a whole—to sustain interest in a single subject over a long period of time may account for much of the superficiality of what is presently reported in our journals. Educational psychologist William Brownell has claimed that in the heavily researched field of reading alone, well over half of the studies—and possibly as many as three-quarters—are products of an individual's first and only sally into the field, and that only a small proportion of the researchers seem to maintain sufficient interest to undertake a second or third project in the area.[4] Apparently many individuals move from a study in reading to one in spelling to a more general status report on some aspect of the profession, much as would a literary critic who writes first on Whitman, then on Herrick, and finally undertakes an analysis of the imagery in "The Parliament of Fowles." Such grasshopper-like thinking occasionally results in fresh and significant moments of discovery; more often, however, it lacks depth and understanding of the complexities of the field. In the long run, the researcher who works within a single field, who comes again and again to the same problem with new approaches based on his accumulation of experience and knowledge, will be more likely to achieve significant results. Longitudinal studies provide one context for such continuing research.

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[2] "A Study of Certain Language Developments of Children in Grades Four to Twelve Inclusive," *Genetic Psychology Monographs*, 1933, XIV, p. 387–491; "An Evaluation of Free Reading in Grades 10–12," *Contributions to Education*, Ohio State University Studies, No. 2, 1936.

[3] *The Language Development of Preschool Children*, Minneapolis: University of Minnesota Press, 1930.

[4] Said to the writer by William Brownell, former Dean, School of Education, University of California at Berkeley.

The financing of longitudinal study also creates serious problems. Seldom are the Nation's univeristies or the major foundations willing to underwrite expensive, long-range research which may continue for two decades or longer. Even the Cooperative Research Branch of the U.S. Office of Education is limited in the support it is able to offer such projects, forcing researchers to organize their problems into a series of separate stages, each to be separately funded and, to some extent, separately reported. Of vital importance in American education is the discovery of ways of maintaining sustained support for truly important long-range studies.

A promising longitudinal study in English presently being conducted by Walter Loban demonstrates the kind of approach which is needed.[5] Loban has been analyzing the language development of 300 children for the past 10 years and plans to continue his work until the subjects are graduated from school. His approaches utilize both newer electronic methods of recording speech and methods of linguistic analysis developed by contemporary linguists. Studies of this kind can yield much information of practical use. For example, Loban's progress report on the language of children in the middle elementary grades supports the observations of linguists that children possess in their speech a knowledge at the usage level of all important patterns of English sentence structure. But Loban also notes that it is less the knowledge of the basic sentence patterns than the ability to generate variations within the pattern, to manipulate the elements within the sentence, that distinguishes the verbally competent child—a finding bearing a striking similarity to the observation reported 20 years ago by C. C. Fries in his study of the writing of adults.[6] Loban's research promises to contribute to our understanding of the steps through which able speakers and writers of the primary school become the able writers identified by Fries. The cumulative results of work such as Loban's should leave us with a far better understanding about how and when teachers can help young people to develop a proficiency in manipulating language. His study is an example of longitudinal research. Other possible studies of this kind, like the following, also need to be suggested:

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[5] Walter Loban, *Language Ability in the Middle Grades of the Elementary School*, Final Report to the U.S. Office of Education on OE Contract Number SAE 7257, March 1, 1961 (mimeo.).

[6] Charles Carpenter Fries, *American English Grammar*, New York: D. Appleton-Century Co., 1940.

Control of language patterns.—We need greater understanding of the way in which young people develop control of patterns of organization in speech and writing, how they develop consciousness of form (whether of paragraph form, the form of a sonnet or a short story, or awareness of the recurrence of unifying elements in an essay). We need to know how and when children first acquire fluency in writing and speech, and how and when they can learn to control and direct this fluency. Only as we learn such information can we discover the most appropriate time to shift emphasis in instruction from free, fluent, but rambling expression to stricter awareness of form and tighter control of sentences. It is important that research of this kind be extended to the secondary years and related in various ways to different patterns of instruction and class organization.

Vocabulary development and concept formation.—Longitudinal studies of concept development in children's thinking, conducted with special reference to vocabulary development and comprehension in reading, may help in program planning. We need to know more about when and how children develop concepts of time and space, of cause and effect, of humor, or of form in art. If a developmental rhetoric is ever to be written, it must be founded on more knowledge than we presently have available. To assert that fourth graders use such words as "although" is not enough, for the disparity between the subtleties of "although" and the writing normally required of children in the fourth grade is enormous. How then can we help fourth graders manipulate the "although" relationship? When do such children begin to use and understand "if . . . then" and similar relationships? The possibilities for important research in this field seem almost endless.[7]

Special aspects of language development.—We need new longitudinal studies into areas which research has not yet penetrated, such as the emergence in children of the inflectional features of language, especially the irregular verb forms, and the development of the phoneme system. Long-range studies on the relation of speaking and writing could suggest how and when oral usage patterns become translated into the written usage of young people. As H. A. Gleason has pointed out, one of the peculiar "blind spots" of contemporary linguists is their failure to give sufficient attention to written language, yet speech and writing interact mutally and in ways that we do not realize or that we underestimate. Spelling pronunciation and spelling reform are opposite reactions at one level, according to Gleason, who observes that "in modern English accommodation of pronunciation to spelling is much more frequent than is spelling adjustment."[8]

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[7] A summary and interpretation of present knowledge, suggesting many research possibilities, is contained in *Language and the Discovery of Reality* by Joseph Church. New York: Random House, 1961, and in *Children's Thinking* by David H. Russell. Boston: Ginn and Co., 1956. Also related to this problem is Russell's *Dimensions of Children's Vocabulary in Grades Four Through Twelve*, Berkeley: University of California Press, 1954.

Teachers can take cognizance of the similarities, differences, and continual interplay between written and spoken language only if they understand the interrelationships. Probably there would be no better step toward such understanding than a thorough, long-range longitudinal study of the interaction between speaking and writing undertaken by a qualified group of linguists.

Research in Articulation and Program Development

Last fall, after thoroughly examining the public schools of Kentucky for more than a year, a State Citizen's Committee made the following observation:

> The lack of articulation, of a carefully worked-out sequence of study from grade to grade, was evident in almost all systems. If a junior high school was part of the arrangement, there was little correlation with the efforts of either the elementary or the senior high schools involved. If the seventh and eighth grades were departmentalized units of an elementary school, the break was likely to be as great . . . . What ever the organization . . . however, the problem for vertical articulation remains and can be solved only by the following of fairly detailed guidelines in English, a close relationship among supervisors involved, and a systematic getting together of the teachers in sequentially related grades both within and between individual schools. Horizontal articulation between the teaching methods and coverage of instructors in the same grades is also a necessary part of the arrangements. The Committee was amazed to discover on many occasions that teachers knew nothing of what was going on in the next classroom, let alone the next grade or the next school.[9]

Those who have visited extensively in the several regions of America know that this charge may be leveled against schools in practically any area. Eleven of the basic issues identified in the co-sponsored conferences of 1958 were concerned directly with the lack of discernible planning of any sequence of studies in English from grade to grade and level to level.[10] Surely the need exists for multilevel research addressed to the problem of ascertaining the nature and extent of desirable overall planning.[11] Surely too, such research must consider both the intellectual development of the learner, already discussed in the section on longitudinal studies, and the integrity of the fields of knowledge to be learned.

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[8] A. Gleason, "What Is English?" an address presented on April 6, 1962, to the 1962 Conference on College Composition and Communication, to be printed in *College Composition and Communication*, XIII, October 1962.

[9] Report of the Curriculum Study Committee to the Commission on Public Education, Frankfort, Ky., October 1961.

At the present moment the profession's interest in maintaining the integrity of our separate fields of knowledge is receiving careful attention—whether we define these as language, literature, and composition; as reading, writing, speaking, and listening (the *language arts*); or in some other way. Yet no matter how we view these separate fields of English, we have stressed for at least 20 years the interdependence of the areas. The separate content field, the separate arts and skills are to be taught in relation to one another even though we have been less than clear about how this is to be accomplished. If English is "literature, language, and composition—period," as one of our more eloquent spokesmen recently asserted,[12] then how do we define language and where and how shall we provide for teaching the needed proficiency in reading and speaking? If our subject is to be conceived of as four language arts—reading, writing, speaking, and listening—where do we place instruction in literature and where, how, and when do we seek a distinction between the traditional language arts of grammar, logic, and rhetoric, and the language skills? Is it possible that articulation in English instruction is best achieved ultimately by introducing different organizations of our subject at different educational levels, rather than by insisting on a single unified framework that stretches from the cradle to the grave? Is there perhaps as sensible reasoning underlying the elementary teacher's rejection of the overall rubric "English" as supports the college professor's antipathy toward "language arts?" In the elementary school, for example, may not sound instruction in certain language skills be planned in relation to social studies content, provided that such teaching does not result in a neglect of carefully planned instruction in language and literature at other times?

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[10] "The Basic Issues and the Teaching of English," presented by members of the American Studies Association, College English Association, Modern Language Association, National Council of Teachers of English, and printed in the fall of 1959 in *PMLA*, *Elementary English*, the *English Journal*, and *College English*.

[11] Basic Issue 2 reads: "Can basic programs in English be devised that are sequential and cumulative from the kindergarten through graduate school?"

[12] William Riley Parker, "Refocusing the English Program." *NEA Journal*, L, November 1961, 38.

In the secondary school, we are talking much of relating language, literature, and composition. Yet how much help do we offer teachers to accomplish this integration? Is it perhaps symptomatic that virtually every book written on English teaching, that virtually every course and every summer institute for teachers finds it necessary to treat the triad of subjects as separate entities—admonishing the teacher to relate them in the classroom but providing precious little help to enable him to do so except through an occasional lesson? If integration of our subject at the instructional level is as crucial as the overwhelming majority of English specialists believe, then perhaps research in program development can show us how it is to be achieved. But is it not possible that such unity is primarily an overall goal of the total educational sequence in English and that at separate times different aspects of content should receive important stress?

Probably no English programs vary more widely in content and approach than those at the college level, especially the introductory courses in literature, composition, communication, and rhetoric—whatever they may be called. We talk much about the diversity of high school offerings and the regrettable lack of agreement on what is offered to the heterogeneous high school population during the 11th and 12th grades. But with a far less heterogeneous population, our introductory college courses differ even more. Only this past year an NCTE committee attempted to establish guidelines for high school-college articulation. The profession talks much about such articulation, but "What are we articulating with?" cries the Council committee.[13] In 75 universities, 57 different books of reading were used, 24 handbooks, 4 omnibus volumes, 12 workbooks, 35 literature anthologies, and 22 miscellaneous textbooks of other sorts. There is apparent disagreement on aim, approach, emphasis, and content by many of the same colleges which send out eloquent spokesmen urging high school English programs to concentrate on first-rate literature, on belles-lettres, while they fill their freshmen's minds with readings from sociology, anthropology and similar subjects. Is a 12th-grade English teacher to be admonished for assuming that the best preparation for reading Ruth Benedict or Clarence Manion in the freshman English course is a high school study of similar material? And when our high school teachers see college composition or college rhetoric completely split from college courses in literature, are they acting illogically if they assume a similar division in high school provides the royal road to salavation?

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[13] Committee on High School-College Articulation of the National Council of Teachers of English, "But What Are We Articulating *With?*" *English Journal*, LI, March 1962, p. 177.

Multilevel research on program development must come to grips with such realities. It must also recognize that real articulation emerges from something more than an excessively rigid, logical reshuffling of discrete skills to be mastered or specific literary selections to be read. Complex understanding is perhaps best developed through a lengthy process of ripening and deepening over a period of years. Patterns of programing may be devised which provide for ever-deepening restudy and reconsideration without repetitiveness. To assume that an eighth-grade lesson on the English verb can "teach" anyone all there is to know about the complexities of noun-verb relationships is to oversimplify the learning problem involved. Most individuals develop their conception of verbs as they develop their conception of people—by repeated acquaintance over a period of years. Can we not identify the basic concepts which require planned introduction early in our program and planned reanalysis later on? The concept approach to curriculum development recommended by Jerome Bruner may lead us in this direction.[14] So may the recent call of H. A. Gleason for a new theoretical construct for our total curriculums based on the study of language—its understanding, manipulation, and appreciation.[15]

Among other crucial questions which may be explored by research, the following appear to be particularly important:

Ungraded and interage programs.—Ungraded programs which permit children to advance from level to level at varying rates of acceleration have been successfully introduced in the elementary school in schools ranging from Berkeley, California, to Sudbury, Massachusetts.[16] Where levels of maturity in reading and language development are carefully identified, such programs permit gifted pupils to advance rapidly, allow others to obtain needed additional help. But if ungraded programs are so useful in meeting individual differences at the primary level, should they not be even more useful later on? The Melbourne, Florida, High School has attracted national attention by experimenting with ungraded programs in the secondary school. The striking success of the advanced placement programs, which have virtually doubled every year since first introduced, suggest the potential opportunities. Should we not then have advanced placement classes, or their equivalent, between the elementary and junior high? Between junior high and senior high? Indeed for learners at every grade? And should we not consider too, whether students in different grades, say the seventh and the eighth, might not benefit from studying certain aspects of language and literature together?

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[14] Jerome K. Bruner, *The Process of Education*, Cambridge, Mass.: Harvard University Press, 1961.

[15] H. A. Gleason, op. cit.

[16] John I. Goodlad and Robert H. Anderson, *The Nongraded Elementary School*, New York: Harcourt, Brace, 1959.

Yet in considering such problems, we need to remember that rate of learning is only a single variable and that, in moving from the rigid classroom organization of the present to any nongraded or flexible grouping, we must be leery lest we only substitute one type of regimentation for another.

Variations in program sequence.—Our present slavish conformity to devoting the same amount of time to English instruction at every instructional level may also bear examination. Is there any sensible reason why 5 hours weekly is required to study English in grade 5, in grade 9, and again in grade 12? Is it not possible that special demands on children at various developmental levels may require more or less time than we are presently willing to devote? For example, 120 to 150 minutes per week are often devoted to the teaching of spelling in most junior high school English classes—one-third to one-half of the English time. Certainly spelling is important but whether it is sufficiently important to occupy such primary attention in any grade is a question we have not yet been ready to ask ourselves. The disturbing facts are not only that during the formative junior high school years many children read more extensively than during any other time in their lives, but that during that period their permanent tastes for literature are more easily developed than during any other period. During that period, therefore, ways should be found to provide more adequate guidance in reading than during any other period. Perhaps program experimentation will lead us to double the hours devoted to teaching English during grades 7 and 8 and to reduce classroom hours devoted to English during subsequent years.

Earlier teaching of selected content.—Economy of time is important in learning English, especially when we seem to have so much to teach. Without sacrificing the concept of readiness, but with a clear recognition that readiness can be developed, can we not consciously experiment with pushing downward through the school curriculum selected aspects of our content in an attempt to discover the optimum time when such material is best presented? Today, for example, we find much experimentation underway on early teaching of reading.[17] But should we not also find out, for example, how mature children need to be before being introduced to literary forms? For years elementary teachers have avoided any analytical study of literature on the assumption that analysis deadens enjoyment. But do we have evidence that this is true? Is it not possible that certain newer approaches to the study of literature may enhance appreciation? And could not such study be introduced not only in relation to standard classics but to well-written contemporary works for children? Experimentation with introducing selected content at early levels should be planned so that we can study the total effects on children to determine better program sequences.

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[17] See, for example, the article by Dolores Durkin and A. R. MacKinnon, "Reading and Five-Year-Old Children," *Changing Concepts of Reading Instruction*, Proceedings of the International Reading Association, VI, New York: The Association, 1961, p. 89-96.

The antecedents and consequences of learning.—Every important learning experience has both antecedents and consequences. Before a child runs, he must walk; before he walks, he must crawl. Developmental studies in language learning will help to identify the sequences of steps which will lead to the mastery of skill. In planning sequential programs, however, we need to know at any instructional level the knowledge which the learner must possess if he is to succeed in normal accomplishments. During the past year, William Riley Parker, Distinguished Service Professor of English at Indiana University, has publicly observed that "Without the least exaggeration, I can say that, as a teacher of graduate students in English, there is not one single assumption I can make about either knowledge or skill already acquired. I cannot assume knowledge of the simplest technical term or the simplest Bible story or myth or fairy tale or piece of children's literature."[18] This observation by a scholar of eminence, a man who has no doubt both selected his graduate students and been selected by them, seems to me one of the most shocking commentaries on present multilevel programs that I have yet encountered. Is there no basic knowledge about English which college majors must learn during their undergraduate years if they are to succeed in graduate school? Is there no basic knowledge about English which students should learn in our high schools? Is there nothing which all should share in the elementary school? We talk much about presenting our common heritage in literature, but the commonness of the heritage seems singularly uncertain if Parker's observation can be supported by others. Somewhere between the Scylla of restrictive uniformity in literary programs and the Charbydis of a permissive anarchy, the Nation's English programs must find their way. In devising instruction in literature, could we not profit from a content analysis of the literary allusions normally required by students who wish to complete most junior high school, high school, perhaps even undergraduate English programs? Some enterprising researcher may even devise a method for assessing the background for understanding allusion needed by the educated American adult.[19] Out of such research could come documented information to demonstrate when and to what extent each child and adolescent needs to become familiar with the wellsprings of our literary tradition—the Bible, the mythology of Norseland and of Greece and Rome, the folklore of the Orient and of western culture; the tales and fables of Aesop, Grimm, and Anderson; Mother Goose, Lewis Carroll, Pilgrim's Progress, the Arabian Nights, and the balladry of our past. We can agree, I think, that some of this background is important for all, but is not all important for some? Perhaps the time has come for some major studies to offer support for those who would or would not introduce such reading in a planned, systematic way. In no sense, of course, need such an introduction mean that all elementary and junior high literature programs would be directed merely toward preparing students for later reading; surely enjoyment and appreciation of worthwhile literature written at each child's level is a continuing important goal. Sound programs in literature must be concerned both with the child's "being" and with his "becoming."

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[18] Parker, op. cit., p. 39.

Procedures and results in school articulation.—More applied than basic research perhaps, but nevertheless of potential importance, would be documented case studies of the ways in which schools—from kindergarten through college—are successful and unsuccessful in instituting program change. How helpful are such practices as developing overall guidelines, selecting a sequence of textbooks, planning departmental meetings, scheduling institutes and workshops, planning seminars with local colleges or summer workshops for teachers? Which procedures are most effective in promoting curriculum change? Some detailed descriptive reports could provide practical assistance.

Research Basic to All Level of Instruction

As important in multilevel research as attempts to link grade and grade or level and level is research in English which cuts so deeply into the essence of our subject that it has implications for teaching at any level. Such is the research, for example, of the linguist who produces a new description of our language. Such, too, is the potential value of any theory of literature or perhaps of penetrating findings in perception and personality which relate to the acquisition of language.

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[19] Some interesting approaches are suggested in portions of *Maturity in Reading: Its Nature and Appraisal*, by William S. Gray and Bernice Rogers, Chicago: University of Chicago Press, 1956.

Here I sketch seven areas in which I believe that basic research may affect the total field.

Language preparation of teachers.—According to the informed estimates of the National Council of Teachers of English, more than 800,000 of the Nation's 900,000 elementary, secondary, and college teachers are comparatively uninformed about the nature and structure of the language that they teach. (This assertion itself might well be documented by an exhaustive status study of the linguistic knowledge of today's teachers.) Whether or not emerging structural and generative grammars need be introduced in the elementary and secondary school classrooms of the country seems less important at this time than insuring that our teachers themselves be introduced to some of the newer insights. An important study affecting all levels of education might be determining the extent to which children taught by teachers (elementary, secondary, or college) informed about the newer descriptions of the English language learn more about writing, speaking, perhaps even about certain aspects of literary study than do students taught by teachers with conventional backgrounds. In such research the important variable could be the background of the teacher, not the content to be taught. The researcher may well hypothesize that the linguistically knowledgeable teacher would select and alter approaches to the content of English in ways unfamiliar to the linguistically uninformed. Even if restricted only to approaches used in teaching composition, such a study could prove valuable.

Language learning.—Applying to English teaching new concepts of drill and habit formation in language learning, such as those established in teaching foreign languages, seems important, especially with reference to the natural method, the use of models, the avoidance of premature emphasis on learning about language as distinct from learning a language, the avoidance of vocabulary study of isolated words, and the construction and testing of lessons involving the repetition of sound patterns and lexical units.[29] Other applications of the audio-lingual approach may also bear study, especially distinguishing between the analysis of language which seeks to build understanding and drill which seeks to establish automatic response. In our English classrooms we frequently confuse the two. Important, also, is a reinterpretation of such established classics as Piaget's *The Language*

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[29] Joseph Axelrod and Donald N. Bigelow, *Resources for Language and Area Studies*, Washington: American Council on Education, 1962; Nelson Brooks, "The Meaning of FLES," *Teacher Education Quarterly*, Vol. XVI, No. 1, Fall 1958, p. 27–29; and John H. Fisher, "The New Interrelation Between First and Second Language Learning," *Reports of Surveys in the Teaching of Modern Foreign Language*, Modern Language Association, November 1961, p. 277–279.

and Thought of the Child, Gregoire's *L'Apprentissage du language*, and Clara and William Stern's *Die Kindersprache.*[21]

Studies in literature.—To the literary scholar, research means new interpretations of *Moby Dick* or new facts about the Elizabethan background of Shakespearean plays; to the educational psychologist, it is more likely to mean concentration on a single act of learning. Both approaches are important, and insofar as English instruction is concerned, a rapprochement must be sought. In language we seem closer to accomplishing this than in literature, largely because linguists and psychologists share a mutual concern with approaches to language study. Can some such overlapping, if not an identity of interest, be nurtured in the literary field?

One model for study respectable both in English and in education is I. A. Richard's *Practical Criticism*, an analysis of problems in literary judgment encountered by the readers of selected poems.[22] The implications for teaching in this work are considerable; similar studies might be undertaken by scholars with differing critical predispositions. Research of this kind could also lead us to identify the sequences involved in teaching students to apprehend tone and imagery, for example, and could support and suggest psychological research in learning and perception.

Similarly, critics and psychologists together, perhaps working as a team, might evaluate different ways of developing understanding and appreciation of literature at various developmental levels—whether by explication or analytical study, by historical, thematic, or topical analysis, or by emphasis on the history of ideas. Especially important at the present time, when broad coverage of snippets of literature arrayed in historical sequence is being replaced by more analytical, textual study of selected works is a consideration of the relationship between detailed analysis and a sound program of guided independent reading.[23]

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[21] Jean Piaget, *The Language and Thought of the Child*, New York: Meridian Books, 1955; Antoine Gregoire, *L'Apprentissage du language*, Paris: E. Droz, Vol. I, 1937, Vol. II, 1947; Clara and William Stern, *Die Kindersprache—Eine psychologische und sprachwortliche Untersuchung*, Leipzig: J. A. Barth, 1907.

[22] I. A. Richards, *Practical Criticism, A Study of Literary Judgment*, New York: Harcourt, Brace, 1950.

[23] The contributions of a guided reading program to developing permanent taste in literature were demonstrated years ago by Lou LaBrant in *An Evaluation of Free Reading in Grades Ten Through Twelve*, Columbus: Ohio State University Press, 1936. Recently LaBrant reported that a followup study on her subjects 20 years after the initial experiment revealed continued significant differences in quantity and quality of reading in favor of the experimental (free reading) groups. See Margaret Willis and Lou L. LaBrant, *The Guinea Pigs After Twenty Years*, Columbus: Ohio State University Press, 1962, p. 127–164. More followup studies of this type need to be encouraged.

Finally, is it not conceivable that proponents of various critical theories may be encouraged to apply their points of view to the study of the literature actually taught in elementary and secondary schools, much as Northrop Frye has agreed to do in a paper to be presented at the Fifty-second Annual Convention of the National Council of Teachers of English.[24] No doubt the comprehension of elementary literature programs by such critics may startle those familiar with conventional teaching, but out of such thinking may come ideas to strengthen present programs. Cannot some of today's students of literature also evaluate some of today's best books for children and young people, not as writing for adults but as worthwhile transitional literary experiences? *Johnny Tremain* is no *David Copperfield*, nor is Marguerite DeAngeli a Thackeray; but serious, sympathetic evaluation of the best of today's books for children by critics sensitive to literary values may illuminate aspects of these works in ways not readily apparent to others. Even a present day analysis of such standard works as Hans Christian Anderson's *The Snow Queen* or the legend of Jason and the Argonauts would help. The more completely a teacher understands a work of art, however minor it may be, the more vital is likely to be his presentation of the work to his students. Teachers in the elementary and secondary schools do not have the same access to an extensive shelf of literary criticism as do their college colleagues.

The characteristics of good and poor writers.—Some highly interesting exploratory research by Barch and Wright recently suggested that the "good" writer is one who worries about organization, about form, about having no clearcut purpose in his writing; whereas the poor writer is concerned about punctuation, spelling, and all sorts of mechanical matters.[25] Moreover, the poor writer, unlike the good, is totally unable to identify good writing in the work of others. Studies of this kind need to be made of children at various age levels with attention to differences in emotion and to other psychological and physiological as well as educational factors. We need to analyze both the grammatical and rhetorical elements used by "good" writers at every level of development and ultimately set these against present practice and prescription in today's programs and textbooks. Out of a series of such studies may well come insights with which to found the the developmental rhetoric suggested elsewhere in this paper.

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[24] Scheduled for presentation at the Americana Hotel, Miami Beach, on November 24, 1962.

[25] Reported in *College Composition and Communication*, IX, May 1958.

The impact of our contemporary oral culture.—Roy Harvey Pearce in the March 1962 *College English* analyzes what he sees as the essential connection of mass culture and popular culture and asserts that "the study of mass culture is in the business of our time a necessary condition of humanistic studies."[26] What Pearce suggests is that the humanities programs in our schools and colleges must somehow educate the individual to transcend popular culture even while he participates within it. Certainly, the effect of our increasing reliance on the immediate oral transmission of ideas (television, telephone, dictaphone, and motion picture) in its effect on our use of oral and written language has scarcely been analyzed. What is the impact of this oral culture on learners at any grade level? Is it not possible that curriculum specialists clinging to child-centered programs designed for children of 10 and 15 years ago are looking at the characteristics of children who no longer really exist? If Paul Witty's findings are correct, the average child now entering elementary school may have spent 1,500 hours or more before a television set, exposed to an adult education, adult language patterns, adult ideas, and adult vocabulary.[27] Is it surprising, then, that dislocations occur when these same children are forced into a restrictive program of elementary education designed for learners with radically different characteristics? For most of today's children perhaps, prereading exercises in visual discrimination are less important than they once were. Restrictions on vocabulary may also be becoming less important, although attention to precision in meaning may become more important. Studies are needed which will ascertain at beginning and later stages in education the impact of our changing oral culture on young people and the ways in which aspects of this culture can be effectively employed in teaching language, literature, and composition.

Cultural deprivation and language learning.—Possibly because of Dr. James Conant's recent excursions to the slums of America,[28] but also because of shifts in the distribution of our society, concern with cultural deprivation is assuming major attention in discussions of curricular change. Often lacking definition, the term is increasingly employed to diagnose underachievement in English at all levels, including at times the college graduate level. What are the constituent elements of cultural deprivation and what effect do they have upon learning the English language? To answer the question necessitates an investigation of the language attitudes of various socioeconomic levels no less than an analysis of regional differences. Here dialectologists should be able to assist us. Can valid measures for assessing deprivation be established for widespread use? Because language reflects so clearly the experimental background of each user, we need more information on how different kinds of people develop in language—the bilingual, the rural American, the children from various ethnic subcultures. Obviously overdue is some refinement of existing testing norms and standardization procedures to account for atypical students.

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[26] Roy Harvey Pearce, "Mass Culture/Popular Culture," *College English*, XXIII, p. 417–432; see also, Walter J. Ong, "Wired for Sound," *College English*, XXI, No. 5, February 1960, p. 245–251, and Robert E. Shafer, "The Communication Revolution and Learning," *Learning More About Learning*, Washington, D.C.: Association for Supervision and Curriculum Development, NEA, 1959, p. 55–64.

[27] Paul Witty, "Televiewing by Children and Youth," *Elementary English*, XXXVII, February 1961, p. 103–113, and earlier studies appearing annually in *Elementary English*, beginning in October 1950.

[28] James B. Conant, *Slums and Suburbs*, New York: McGraw-Hill, 1961.

Evaluation of learning.—One of the reasons teachers become so concerned about evaluation is that they know how intricately it can and does influence learning and teaching in the Nation's classroom. Thus, studies are needed at every level to ascertain better and more basic ways of assessing growth in important aspects of our program. Especially needed is more attention to assessing growth in literary appreciation, so that standardized tests of reading skill and factual recall of literary situations do not become the hallmarks of a successful program.[29]

In evaluating language growth, a committee of the National Council of Teachers of English recently recommended that a full-scale analysis be made of the skills, knowledge, attitudes, and understandings included in various aspects of linguistic proficiency, such as those required in communicative, creative, interpretive, editorial, scholarly, and technical ventures.

Any teacher of oral language knows well that measures of such instruction do not extend beyond the simplest possible attempts to indicate degree of participation in platform manner. Virtually no one has tried to find ways of assessing oral use of vocabulary, organization of ideas, relevance of the speaker's ideas, his objectivity, and other important aspects of oral use of language. Indeed little attention has been given to evaluating the *what* of oral language and almost none to the *how*. Is there any manageable way to develop sound methods?

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[29] A major contribution in applied research will be published during the academic year 1962–1963 by the Commission on English of the College Entrance Examination Board which has developed and field-tested in a variety of classrooms suggested sample teacher-constructed tests for the 4 years of high school.

Conclusions

Here then are three areas of multilevel research worthy of exploration. But to improve our school programs, research which affects more than a single level must be accepted and understood. I close by commenting on what seems to me one of the most basic problems now facing those who must disseminate the results of sound multilevel research. As Executive Secretary of the National Council of Teachers of English, I have become painfully aware of the genuine gulf which separates men of goodwill in various segments of our profession, and I speak here of the profession of English teaching broadly conceived, ranging from those whose basic research is in language, literature, and composition to those whose basic research is in the teaching and learning of language, literature, and composition. All of us profess a willingness to cooperate for the common good, but sometimes only on our own terms. Severely needed is greater understanding of what the other person is trying to do and of what each of us cannot do alone. Elementary specialists need to learn about language and literary scholarship; college teachers need to understand what can be gleaned from an assessment of methods of teaching spelling in the fourth grade. This is a multilevel problem in dissemination and interpretation, and one not only concerned with the results of research but with the processes and methods used at different grade levels and in different fields. Unless we can somehow surmount present barriers to understanding, I think it unlikely that multilevel research will significantly affect school and college programs.

Nowhere today can this problem in understanding be demonstrated more graphically than by surveying the current controversies over primary reading. For reasons of many kinds, some of which as I suggested earlier may be related to changes in our culture, widespread dissatisfaction within and without the profession has arisen concerning the teaching of reading. Professors of English and educational theorists, often inaccurately branding the eclecticism embraced by most basal reading approaches as a single "look-say" method, are quick to recommend equally one-dimensional "phonics" or "individualized reading" approaches. Too seldom are these critics willing either to subject their own recommendations to testable research or to consider how the new ideas may be incorporated in modified programs. Some "basal reading people" on their part rush much too quickly to the defense, often seeming to suggest that theirs is already the best of all possible worlds. School supervisors, responsible for selecting basal readers, defend the books, yet fail to observe any inconsistency between their defense and the rapidly growing adoptions of superimposed special phonics programs. And in meetings of supervisors, the tired little jokes concerning the language of basal readers continue to evoke smiles, indicating all too clearly that these elementary specialists often lack respect for the very books they are so willing publicly to defend.

Into this confused situation now comes the linguist, possessing information about the sound and grammatical structures of English on which he believes a scientifically based system for teaching elementary reading may be based. During recent months, several important publications and articles have presented insights which may result in changes in present practices, provided that these insights can be related to what is presently known about children's learning.[illegible] Unfortunately, to many reading specialists such valuable new recommendations often seem to represent little more than new "all out" attacks on present instructional programs—and, to be sure, much of the writing betrays all too quickly the ignorance of some linguists concerning tested research in reading and classroom experience in teaching accumulated over the past 50 years.

It is right, proper, and eminently desirable that a scholarly student of the English language should concern himself with the teaching of the language in our primary schools. It is equally right, proper, and eminently desirable that his recommendations be carefully studied. But is it too much to ask that the scholar inform himself about what is already known about the teaching of reading before presenting specific recommendations for classroom practice? And is it too much to ask, on the other hand, that the educational psychologist and the specialist in the teaching of English also inform himself about developments in language, rhetoric, and literary criticism before studying how students learn these subjects? Surely we cannot be satisfied with anything less.

Perhaps the attitude which we must cultivate in multilevel research is best indicated, again with respect to reading, by linguist Raven I. McDavid, Jr., who last year tried to indicate the areas of competence and incompetence which a scholar in language might possess.[illegible] McDavid sees the role of a linguist in a reading program as essentially threefold:

1. To analyze the language scientifically, with particular attention to the simple constituent elements.

[illegible] Leonard Bloomfield and Clarence Barnhart, *Let's Read: A Linguistic Approach*, Detroit: Wayne State University Press, 1961; Robert A. Hall, Jr., *Sound and Spelling in English*, Philadelphia: Chilton Co., Book Division, 1961.

[illegible] Raven I. McDavid, Jr., "The Role of the Linguist in the Teaching of Reading," *Changing Concepts of Reading Instruction*, Proceedings of the International Reading Association, New York: The Association, 1961, p. 253-256.

2. To analyze in similar fashion the writing system by which the language is represented.
3. To determine the degree of fit between the two systems, and to discover the patterns of correlation between them that may facilitate the teaching of reading.

Clearly these are tasks for which only the professional student of language is equipped, and the reading specialist must and should look to the work of such scholars in organizing his program.

But McDavid also identified many problems "which the linguist is not competent to decide," although he recognizes that some linguists may have competence in one or more areas because of other professional attainments:

1. The nature of the learning process itself.
2. The mechanical-physiological problems of muscular movements and eye-spans.
3. The learning-load in terms of the number and distinctiveness of discreet symbols to be presented at one time.
4. The sequence in which parts of the graphic system are introduced as representations of parts of the sound system.
5. The problem of reading-readiness, in terms of physical coordination and psychological motivation.
6. The sociological pressures that encourage or discourage reading.

These, then, are problems for which a specialization other than the purely linguistic is needed. And similar problems and areas of responsibility may be identified in composition and rhetoric, in literature, and in all other dimensions of our field. Sound instruction in English must be based on both an understanding of content and an understanding of the process of learning. Only on such a foundation can influential multilevel research be based. Professor McDavid's final admonition to linguist and reading specialist may well be applied to us all.

To the reading specialist he said, "Don't stop calling on the linguist. It is true that he can't solve all your problems. But so long as you call on the true linguist and insofar as these problems are concerned with the structure of language, he has much to offer."

And to his fellow linguist he said, "This application of linguistics is one of those which may help determine the future of our civilization. Don't be afraid to cooperate. It is not only important, but interesting. And like many other applications of linguistics, it may lead to discoveries that will in turn advance linguistic theory." [illegible]

[illegible] Ibid., p. 256.

The Study of Language in English Teaching

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THOSE OF US who have for some years been advocating a revision of the linguistic foundation of high school and college English teaching are beginning to understand how Moses must have felt when he first saw the promised land. The happy day when every English teacher has had some solid training in language study and when every English curriculum includes a reasonable proportion of interesting and accurate instruction about the language itself is still a long way off, but we have had at least a Pisgah-sight of it. After many years of attempting to reassure our students that they could get jobs as English teachers in spite of having had linguistic training, provided they kept quiet about it, we now find ourselves besieged with letters from colleges and school systems, inquiring almost frantically where teachers with linguistic training are to be had. After years of pleading for a modest spot on the programs of local and national gatherings of English teachers in order to raise our piping voices in advocacy of our cause, we now find ourselves sought after and actually paid money to act as consultants to school systems and to speak at conferences such as this one. Such success falls short of being intoxicating, but it is, to say the least, gratifying.

But lest our view of a distant land of promise mislead us, there is plenty of evidence to show how distant it really is. The recent incredibly vicious assaults in the respectable periodical press on the new edition of the Webster dictionary are evidence of how far even competent professional writers are from understanding the nature and purpose of linguistic scholarship. One reviewer of considerable standing, who has had a long connection with the liberal press, attributed all of what he conceived to be the faults of the new dictionary, as well as other infelicities in the language of our day, to a sinister group that he called Structural Linguists. So subversive did he make this group out to be that the editor of the dictionary found it necessary to state in public recently that he is not now and never has been a structural linguist. The misconceptions and prejudices behind these attacks in such respected organs as the *New York Times*, the *Washington Post*, the *New Yorker*, the *Nation*, and the *Atlantic Monthly* have been clearly and temperately revealed by Bergen Evans in the current *Atlantic*, but I predict that he too will be found to be a subverter of the language. Indeed, he has already earned that distinction by publishing his excellent *Dictionary of Current American Usage*.

The educated public, then, if we are to judge by the reaction of the upper middlebrow press to a monumental work of linguistic scholarship, is misinformed about many aspects of language study. But these writers, being middle-aged, are the product of the English teaching of a generation ago. What is the current situation?

At first, as I suggested at the beginning, one is tempted to be optimistic. One thinks of school systems like Westport, Connecticut, and Portland, Oregon, where serious and mature study of language is being incorporated into the secondary English curriculum. Or one remembers that the three-part program of summer institutes sponsored by the Commission on English of the College Board established language on a par with literature and composition as a subject matter in which secondary English teachers need to be retrained. Or one notes with approval that the National Council of Teachers of English, in establishing a Commission on the English Language, has set the study of language on a par with curricular revision and the state of the profession, which are the areas of concern of its other commissions. All of these are encouraging signs indeed. But they are only indicators of growing concern in a few quarters—admittedly influential ones. The sobering realities of the situation are to be found elsewhere—for example, in the revelation in the National Council's survey, *The National Interest and the Teaching of English* (Champaign, Illinois, 1961), that only a small proportion of the newly trained teachers of English currently going into the profession have had any kind of linguistic training. Or in the results of a survey, summarized by Ingrid Strom in her recent report of research in secondary English teaching (*The English Journal*, LI, February 1962, p. 123-140), in which it was revealed "that structural grammar is being used to some degree by almost 4 percent of the approximately 4,000 teachers of English" in California, and "that about 10 percent of the high schools in California had an English teacher who indicated that there are signs of linguistic activity within the English department." Four from 100 means that 96 percent of the English teachers in the high schools of one of the most progressive States are *not* using structural grammar to any degree at all; and 10 from 100 means that 90 percent of the high schools of California have no English teacher able to indicate that there are any signs of "linguistic activity" in the English department of his school. In the light of figures like these, the promised land seems a long way off indeed.

It seems to me that a conference such as this, dedicated to a survey of the whole field of English teaching with the aim of identifying areas where study and research are necessary, should be concerned with the answers to four questions:

1. What is the current status of the study of language in English teaching?
2. If the current status is found to be unsatisfactory, what form should this kind of study ideally take?
3. What are the obstacles to the attainment of this ideal?
4. What steps can be taken to overcome these obstacles, and where and by whom can these steps most effectively be taken?

Let me address myself briefly to each of these four questions, with the aim not of giving answers but of suggesting the lines our further discussion may take.

1. I have already suggested some aspects of the current status of the study of language in English teaching. Somewhat more systematically I should like to make the point that, with the exception of the experimental minorities I have alluded to, the teaching about language to which our students are submitted is minimal, second or third hand, perfunctory, and subordinated to various other aims and aspects of English teaching.

Consider, for example, the program and content of the so-called "traditional grammar," which is the only aspect of language study customarily taught in most schools. In a recent address to the Conference on College Composition and Communication, Professor H. A. Gleason described in devastating terms what "traditional" in this context normally means. As he put it, the content of grammar instruction has been subjected to a continuing process of reduction. State or local curriculum writers, moved by the urge to simplify grammar because, so they believe, its complexities are what make it distressing to students, incorporate in their syllabuses only those aspects of grammar which are common to all the textbooks. Textbook writers, in turn, survey the syllabuses and include only those aspects which are common to all of them. The result has been a continuing attrition of what was a fairly rich grammatical tradition in the school grammars of the later nineteenth and early twentieth century. As a result, the average student gets the notion that grammar includes, on the one hand, the ability to identify the parts of speech in selected (usually quite artificial) handbook sentences—a purely taxonomic activity—

and, on the other, learning a certain number of prescriptive shibboleths which often show little realistic relation to the language he uses or the language he reads.

To a grammarian, this travesty of his subject is distressing in the extreme. It suggests nothing of the beautiful intricacies of language, its exasperating illogicalities, and its ingenious solutions of difficult problems. To teach grammar this way is as if we were to teach the alphabet not so one could read and write, but simply so one could identify and name the letters. Taxonomy and classification are necessary to any study, but they are only the beginning. If chemistry stopped with naming and identifying the elements, it would be a jejune and stultifying science indeed. It is no wonder that grammar has the reputation of being dull, and that both students and teachers with originality and energy of mind prefer to skip it entirely.

The one linguistic discipline which is most generally taught is thus the sterile end-product of a misguided effort at simplification wedded to an equally misguided purpose of prescription. Other aspects of language study, with one exception that I will take up in a moment, are commonly passed by almost completely. The ordinary student learns virtually nothing either in high school or in college about the nature of the speech process, the phonological structure of language, the nature of linguistic change, the history of the English language, or the nature, diversity, and status of variant dialects. The one area where a good deal apparently is done, at least in some English programs, is that of word-study and semantics. This study usually emphasizes the merely picturesque, quaint, or doctrinaire, but it does get students interested in words. Some even acquire an honest respect for the scholarship that goes into the preparation of a good dictionary. But to judge by my own experience with college freshmen, not many of them have studied with any care or guidance the fine print in the front of their *American College Dictionary* or Webster's *Collegiate*.

2. My answer to the first question, then, is that the current status of the study of language in English teaching ranges from unsatisfactory to appalling. What form, then, should this study ideally take?

A complete answer to this would be a curriculum plan covering at least eighth grade through freshman year at college. No such plan exists, nor do I have time to develop one here. But I should like to sketch the objectives and some of the materials of what I would consider an adequate program in the English language for the average high school student. As I see it, the objectives should be threefold:

a. To inform the student about the nature of language, its place in human history and culture, its relation to the formulation and communication of ideas and to the expression of artistic and philosophic insights and perceptions.

b. To supply the student with information about his own language—its structure, its vocabulary, its history, its variety, and its present important position in world affairs.

c. To encourage the student to have a wholesome respect for his language, manifesting itself in a more sensitive, careful, and accurate use in both writing and speech.

An English language program aiming at these objectives need not take much more time than is at present given to the annual rehash of grammar that is common from grade 7 or 8 through grades 10, 11, or even the freshman year in college. A consistent, accurate, and realistic grammar, aimed at studying the dynamic aspects of language structure rather than a sterile taxonomy, can be presented and thoroughly learned in one year—perhaps in the eighth or ninth grade. Such a grammar is of about the same order of complexity and difficulty as algebra, and bears some resemblances to it which can be capitalized upon. It can also be prepared for in the earlier grades. But once taught it should be assumed, and not retaught or extensively reviewed each year. If continued use is made of it in the subsequent teaching of literature and composition, review will not be needed.

Secondly, the program should contain substantial material on words—not with the aim of artificially increasing vocabulary, but with the idea of developing an understanding of the nature of meaning, the derivational and morphological relationships of words, and the reasons for vocabulary and semantic change. A thorough introduction to dictionaries belongs here.

Thirdly, the whole question of linguistic variety—regional, class, and stylistic—and the problem of standards of usage should be explored.

Fourthly, the program should include some study of the history of English, from its Indo-European origins to the present, with emphasis on structural and vocabulary change, and on the way in which external, nonlinguistic events have promoted an obscure group of Germanic dialects into a great world language. Much of this can be done in relation to the study of literature, though literature should not be used merely as laboratory material for linguistic history.

3. To some, the obstacles to the realization of such a program may seem insurmountable. They are, indeed, massive, but I believe that they can be overcome and that one of the purposes of this conference is a preliminary exploration of the means. I believe that these obstacles can be grouped into three categories:

a. The average high school English teacher—in fact, the average college professor of English—is not adequately equipped to teach such a program.

At present only specialists in English linguistics, who are woefully few, could do so.

b. The subject matter is, at some points at least, intrinsically difficult. We are not at all sure that the average high school student is capable of handling it.

c. In certain parts of the subject matter—grammar, for instance—there is considerable disagreement among specialists about methods, premises, and conclusions. Having decided to teach grammar, how are we to decide among competing systems what grammar to teach?

4. These are substantial obstacles, but as I have already said, I do not consider them insurmountable. The answer to the first is, of course, to make adequate training in language study an important part of the professional equipment of every English teacher. This must, of course, take two forms: the inclusion of much more language study in the teacher-preparation program than is now the case, and provision for summer and inservice institutes and sabbatical leave for further study to make up the deficiencies in the preparation of those already teaching. In both of these areas, Project English gives promise of being of inestimable value.

The second problem—uncertainty as to the ability of the average high school student to handle this kind of language study—must be met by experiment and research. I wish that Professor Jerome Bruner were here to reiterate his faith that any subject, properly prepared and presented, can be taught on any level. Until we have teachers and school systems willing to experiment, as Portland, Westport, and others are now doing, with the presentation of this kind of language study, and until there are adequate texts and other materials for them to use, we cannot know how and at what point in the English program these various subjects can most advantageously be handled. Once again, the role of Project English is obvious and important.

As to the disagreements among linguists and grammarians—these do not worry me in the slightest. When the physicists have reconciled the quantum and the wave, when the psychologists have brought Freud, Jung, and Watson into the same camp; when economists have made a harmonious choir out of Adam Smith, Marx, and Keynes—then it will be time enough to worry about the fallings out among grammarians. The present ferment in what was for long a passive if not petrified subject is to me a healthy sign. I believe that just as every generation must rewrite history and literary criticism, and apparently every decade must reformulate physics and medicine, so every generation or so must revise if not completely rewrite grammar. If this seems like an attack upon eternal verities, it is so intended. All I ask of anyone who deplores it is that he point out any other field, from archeology to zoology, where eternal verities have survived the intellectual revolution of the last century. Grammar is a way of looking at and formulating the facts of language; it changes as modes of observation and formulation change.

Parenthetically I might point out that more research—of the kind amusingly called "pure"—can also be of great value here. I imagine that a tiny part—perhaps one percent or less—of what it cost to send Colonel Glenn out of this world and fetch him back again would support a committee of the most distinguished grammarians of our time in a 5- or 10-year program to write a midtwentieth century grammar of English that might stand beside the Oxford or the Merriam-Webster dictionary as a monument of linguistic scholarship. Some of this is being done indirectly, by the people working on translation by machine from Russian into English. I see that later in this conference Dr. Reitman is to talk to us about how some of the miraculous new data-processing equipment—familiarly called "hardware" by its users—can be employed in research in English. One of the ways, as we are just beginning to find out, is in the collecting and collating of the kind of data on which grammars must be based. But I am afraid that even Project English will not be allowed to spend a tithe of the price of one intercontinental ballistic missile on such an undefensive—if not indefensible—project as pure research in English grammar. That would really be the millennium.

Psychological Measurement and Research on the Teaching of English

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THE INTERESTS of psychologists and of language educators intersect at a number of points. The reciprocal relevance of English education and psycholinguistics, cognitive psychology, and the psychology of learning are being discussed at various points in this program. I represent a branch of psychology that bears one of those coined names that make the language scholar either wince or marvel, depending upon his own professional orientation—the field of psychometrics. The etymology of the word "psychometrics" is not very helpful for elucidating its meaning: the "psych" in psychology lost its etymological heritage when psychology lost its soul to behavior. Perhaps it will suffice to say that psychometrics is concerned with the measurement of psychological processes as they can be represented by or inferred from observable behavior.

Thus, the psychometrician is likely to find the English language professionally interesting, as does the linguist and the humanist, for in addition to being a means of communication and a medium for artistic expression, language is a complex kind of behavior, implying an even more complex set of underlying processes. In order to evaluate a particular approach to teaching English, we need to obtain measures of the outcome of learning, of changes in thought processes, in terms of communicable observations. And the variation of teaching approaches enables the psychologist to study the variations of behavior that result.

This paper discusses a few points at which research in English education and psychometrics come to a focus—points at which the procedures of psychological measurement might contribute to research on English education, and at which such research can contribute to understanding of psychological processes. First, I will mention briefly a few methodological concerns that a psychologist would have at the outset of any experiment, concerns that come often from painful experience in attempting to interpret results. Then, I will offer

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two more specific instances in which these concerns come to a focus in research on English education, and finally, some questions for research that would seem to be of equal interest to psychologists and English teachers.

Problems of Research Design

The objective of research design is to set up at the outset a plan for conducting an experiment and collecting data, a plan which will maximize our assurance that conclusions can be drawn unambiguously after the observations have been made. There are, of course, many technical complexities involved in research design, and references on technical aspects of experimental design and test construction are likely to be indispensible guides for research workers.[1] Research design, however, is not a problem that can simply be *assigned* to a technical specialist; the nature of the controls used is integral to the research hypothesis, and thus requires the careful attention of the substantively oriented research worker. Two general kinds of questions requiring the researcher's attention may be mentioned: the sources of variation in outcome observations, and the sensibleness of the measures of outcome employed.

Sources of Variation

The problems of control might be conveniently conceptualized as problems of knowing why our outcome measures vary. The usual paradigm for an experiment to evaluate an educational experience involves giving students a test at the beginning of an experimental course and again at the end of the course with the expectation of finding variation or change between the "before" grades and the "after" grades—hopefully variation in a particular direction. We would like to conclude that the educational experience is responsible for the observed change. But there are other factors at work that might complicate that conclusion. Three of these factors that deserve special attention are the students themselves, the fact of special attention, and the teachers.

The students.—It is apparent, and perhaps fortunate, that some students will learn something no matter what we do to them. We would like to assure that the improvement in performance that accompanies an innovative program can actually be accounted for by that program. The definition of an appropriate control group and control experience is difficult in any experiment and perhaps especially so in research on teaching. The emotional investment (and cash investment) in an innovative approach to teaching is often so great that it becomes almost impossible to equate the enthusiasm of teachers for the experimental and control groups. Moreover, the labor of matching students in the two groups with respect to ability and motivation and of equalizing other conditions of instruction is likely to seem wasteful and distasteful. You will agree, I'm sure, that the labor is nonetheless necessary. Perhaps we would do well to try to define experiments which contrast two *equally interesting* approaches, for example, a sequence based upon a repetitive or spiraling presentation of ideas as compared with a sequence based upon a hierarchical or cumulative approach. In addition to making the design test more interesting, such experiments would contribute more to understanding the process of learning.

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[1] A good introductory reference on experimental design is William S. Ray's *Introduction to Experimental Design*, New York: Macmillan, 1960. A more detailed and technical treatment is provided by Everet F. Lindquist's *Design and Analysis of Experiments in Psychology and Education*, Boston: Houghton Mifflin Co., 1953. Problems of measurement are discussed in detail by Robert L. Thorndike and Elizabeth Hagen in *Measurement and Evaluation in Psychology and Education*, New York: Wiley, 1955, and by Dorothy A. Wood in *Test Construction*, Columbus, Ohio: C. E. Merrill Books, 1960.

The fact of special attention.—A number of studies have indicated that subjects in an experiment are likely to modify their behavior simply as a result of being singled out for special attention (the much discussed "Hawthorne effect"). The classic instance was a study of employees performing a mechanical task under varying lighting conditions. The employees in the experimental sample performed better than they did before the experiment began under *any* lighting condition—even when the original conditions were restored.[2] A similar effect may be anticipated when students are selected for a special experimental course. Precautions to make the control course as "special" as the experimental course, or the experimental course as "routine" as the control one can do much to overcome this effect.

Teachers.—It is axiomatic that teachers differ in ability to effect improvement in students. If experimental and control groups are taught by different persons, it is impossible to determine whether the effects are due to the course or the teachers. A minimal control of this factor would be to have the two courses taught by the same person. But since it is most difficult to equalize a teacher's enthusiasm for two courses, it would be even better to present each course at least twice, with two persons teaching each course.

Sampling error.—Finally, even if variation between outcomes of the experimental and control treatments is random, having nothing to do with the experimental treatment, we might happen to get a case in which the random variation produces an outcome which seems to be in favor of one treatment or the other. The outcome would not be systematically repeatible upon repetition of the experiment. We guard against erroneous generalization of such observations by using statistical tests of significance.

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[2] Fritz J. Roethlisberger and William J. Dixon, *Management and the Worker*, Cambridge, Mass.: Harvard University Press, 1939.

The Measurement of Outcome

The precautions we have been discussing have presupposed that we have a meaningful way of observing and recording some important difference between a student's performance before his encounter with an educational experience and his performance after that encounter. A good teacher is well aware of the difficulties involved in relying upon tests for the evaluation of students. Most teachers feel it necessary in assigning course grades to balance examination performance with their own subjective appraisal of what the student has learned. But in interpreting and communicating the results of an experiment, conclusions must be based upon observations comparable for all students if they are to be meaningful outside of the immediate context of the study. The burden of providing sensible indications of student's behavior is borne solely by the measuring procedure. The precautions to be taken in developing such measures are similar to those needed for any measure of ability or achievement—in mathematics, engineering, or mechanics, as well as in English. We may mention briefly two general kinds of questions to be asked of any measuring device before discussing a more specific application to evaluating English education. These questions concern the *reliability* and *meaningfulness* of the tests.

Reliability.—We may say that any test score has a systematic component—one directly related to the student's actual ability—and an unsystematic component—reflecting errors of measurement. The systematic component ought to be repeatable upon successive uses of the test, unless the student's knowledge or ability has changed in the meantime. Errors ought not to be systematically repeatable. We say that a test is *reliable* to the extent that variation in test scores may be accounted for by the systematic component.

Some approaches to estimating reliability should be mentioned briefly. A student's performance on a test should be consistent from one occasion to another; otherwise, there is evidence that unsystematic variation is introduced by the test's sensitivity to momentary factors that are not relevant to the student's ability. There should also be consistency of performance on different items or parts of a test if the parts are to add up to a meaningful score. These forms of consistency may be readily checked, and our experience indicates that satisfactory reliability may be obtained. Nevertheless, the labor of empirically checking these reliabilities will be well spent in terms of our confidence in the conclusions.

One particularly troublesome kind of unreliability results from lack of agreement among judges of performance. If two graders, equally qualified and expert, grade a set of tests and if there is little relationship among the scores they assign the same individuals, there is clear evidence that there is unsystematic or error variation somewhere in the combination of tests and judges. Such "error" undoubtedly results in part from differing values of the judges and thus, it may be argued, is not really error. But such a situation would make us reluctant to accept any of the judges' opinion or any composite of them as evidence regarding whether or not a student would be admitted to college. Nor would we have confidence in reported research results based upon the test. Some suggestions for increasing inter-judge agreement are discussed below.

Meaningfulness.—It must be apparent by now that a measurement psychologist views a test with cautious distrust. The skepticism with which he would view the meaningfulness of a test is at least equal to that with which he approaches reliability. Let us look at just a few of the questions that may be asked about the meaningfulness of a test.

1. *The content of the test.*—The student's performance on a test is, of course, merely a sample of the behavior in which we are interested. We want the student to use English effectively and creatively in writing, speaking, and reading, in a manner that is profitable, pleasurable, or communicative. Test performance gives a glimpse of behavior from which we wish to infer something about performance in more generalized conditions. Does the *content* of the test adequately represent the universe of performance about which we want to generalize? If we wish to assess literary comprehension, for example, we would want to make sure that the passages used in the test contain more than one kind of material—expository, descriptive, persuasive, etc. It is easy to overload a test with a particular kind of content, or a particular level of content, to the extent that it poorly represents the kind of behavior we are interested in. Procedures for avoiding such results include specifying carefully the kinds of behaviors of interest beyond the test, constructing items representing each kind of behavior, and sampling from the items to construct the test. The judgment of authorities in the subject-matter is crucial to *all* of these processes, not just to the writing of items.

2. *The test's correlation with other behavior.*—The validity of a test is often discussed in terms of the test's correlation with other measures

We would expect a meaningful test of performance in English, for example, to be correlated with grades in high school or college English courses, with teachers' perceptions of the students' abilities, or with some other independently obtained measure of performance. We would also expect performance on the test *not* to correlate highly with certain measures. For example, we would expect a meaningful test to be correlated with general intelligence, but by no means perfectly correlated, for we do not conceive English ability to be synonymous with general intelligence. We would also want to be sure that the test is not unduly sensitive to extraneous factors, such as understanding of instructions, test-taking anxiety, and response sets or habits that are not relevant to the content of the test. These questions call for empirical analysis of performance on the test, in addition to content analysis.

Measuring Ability in Composition

Many phases of ability in the use of the English language have been successfully measured, i.e., measured with acceptable reliability and meaningfulness. Reading can be scored reliably and meaningfully for speed, recall, and understanding. Vocabulary may be tested by means of forced choice tests, or by graders' judgments with reasonable inter-judge agreement. Such matters as spelling and grammatical usage are readily summarized in rules. But attempts to measure meaningfully and reliably the complex abilities involved in actively using the language to convey ideas, as in composition, have met with small success. No method for evaluating abilities in composition in terms of "objectively" scored items is apparent. And measures based upon judges' evaluations of actual compositions are almost invariably characterized by poor reliability. Efforts to compromise—e.g., having the student judge which of two passages expresses an idea more adequately, or to choose among alternative usages—may be and often are criticized with regard to meaningfulness. Thus the measurement of compositional ability—a challenge for the measurement psychologist and a needed source of information about accomplishment for the educator—is a focus of research interest for both.

I have no solution to suggest, but the combined efforts of psychologists and English educators in the context of the kind of research projects we have been discussing ought to enable us to attain more adequate solutions than are now available. I should like to propose for discussion some possible directions for such work.

A major source of difficulty in evaluating a sample of a student's writing ability is that two processes are involved. First, there is the problem of assessing or describing as objectively as possible what a student has done. Secondly, there is the process of deciding the value of what he has done, a process that involves the values of the judge as well as the behavior of the student. A few reflections upon literary criticism should be sufficient to convince us of the amount of variation introduced by differing values among judges. Such variation—as far as the student's work is concerned—is unsystematic variation, since the student's work is the same for all judges.

I would not argue that variation in value assignment is undesirable; hence I see the strategy of "training" judges to be more consistent as being of limited usefulness, except for the limited purpose of achieving similar frames of reference among personnel of a particular research project. My alternative suggestion is quite simple (which doesn't necessarily mean that it will work), but, so far as I know, has not been tried systematically. It is simply to accept the "dual process" nature of evaluating performance, and to consider the two processes—the description of products of behavior and the assignment of values to those products—as separate universes of behavior, each meriting research attention in its own right.

Suppose a number of qualified judges examine a single piece of student writing. There are, no doubt, many aspects of the paper about which the judges would agree. How many grammatical errors did the student make? What kinds of errors were they? Did the grammatical errors appear to result from carelessness, ignorance, or imaginativeness? Similar questions could be asked about sentence and paragraph structure, adequacy of expression, and *sequential* organization of ideas. On the positive side, judges might note uses of allusion and metaphor, facilities of expression, and the ease with which the development "flows." Some of these observations might be reducible to mechanical or clerical recording. On others, judges might agree, or learn to agree, concerning the *occurrence*, if not necessarily the *importance* of the points.[3] The result might be a set of scoring categories on which satisfactory inter-judge reliabilities could be obtained. While this happy outcome is by no means obvious, it seems sufficiently promising to merit careful investigation.

But, in so constructing our scales, we have taken no precautions to assure that judges would agree in the explicit or implicit weight they would place upon the various categories in assigning overall grades. Thus we would have no guarantee of inter-judge reliability of global evaluations, and most of our experience indicates that the likelihood of attaining it is small. If we have reliable category scores, however, several recourses are available to us. First, we could simply describe as objectively and explicitly as possible the performance of students in terms of our category scores, leaving it to users of the data to make value judgments. Secondly, for a particular research project we could evaluate performance in terms reflecting the values of the particular enterprise—a device that provides the fringe benefit of helping and encouraging researchers to state their objectives explicitly. A third approach, particularly fascinating to the psychologist, would be to study the value systems of those who make judgments on the performance in an attempt to understand and predict on the basis of information about their own attitudes how they will assign global grades.

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[3] The "component elements analysis" of students' writings mentioned by Dwight Burton in his paper in this conference might provide a useful basis for such a study.

The Elements in an Educational Experience

We have assumed to this point that a course or method of educational experience is unitary, to be evaluated as a unit. In practice, this assumption is seldom true. An experimental course is likely to embody numerous interlocking innovations. If the course is successful, shall we recommend that *all* of the innovations be adopted as standard practice? Or if the course seems not to be superior to other courses, shall we conclude that none of the innovations is worthy of retention? In order to understand our results properly, we need some information about the relative contribution of the various parts of the course.

Again there is no standard or universally acceptable procedure for accomplishing this goal. We may at this point merely suggest some approaches. First, it may be possible to introduce systematically only one new element at a time into an educational experience. This procedure might be especially effective as a preliminary to developing a new total curriculum. Another useful approach might be to evaluate the student's performance sequentially throughout a curriculum and watch for sudden increased effectiveness of performance which might indicate a particularly effective curriculum element, or for plateaus during which no increase in effectiveness seems to occur which might indicate a less effective element. In using this approach, it would be most desirable to vary the order of presentation for different sections or for different years and to be particularly sensitive to possible cumulative effects in which the effect of one element might not be apparent until after another is introduced, and to delayed action effects, in which the effects of one element might appear only after a lapse of time. A third approach is intriguing to a psychologist. That is the conduct of what we may call "prototype" experiments, in which particular new ideas are singled out for examination in isolation. For example, suppose it is hypothesized that facility of expression may be increased for a ninth-grade class by the introduction of a 2-week unit of comparative linguistics in which the students discuss relationships among and within language families with regard to the methods of expression that are typical or permitted. We might be able to study the effects of 4 weeks of study by each of two groups of eighth-grade students. One group would experience the 2-week linguistic unit followed by 2 weeks of English composition; the other group would spend the entire 4 weeks on English composition. Such an experiment would provide some way of estimating the effectiveness of the particular innovation in a whole curriculum; it would also provide valuable insights into the role of generalization in the process of learning and thinking.

I should add at this point that I am not unaware of the practical and administrative difficulties in instituting the idealized procedures I have been advocating. I can, however, cite instances from no less complicated contexts in which a combination of pertinacity, flexibility, and willingness to compromise has resulted in opportunities to accomplish a useful approximation of the ideal research conditions. I am completely convinced that the benefits to be gained in the meaningfulness and usefulness of our conclusions make a great deal of effort worthwhile.

A few words in summary. A recurrent theme in this conference has been a plea for "help from the psychologists." Such help might come from several directions. As I hope this paper has suggested, some of the principles of behavioral measurement and research design that constitute the psychologist's tool-kit are directly usable and relevant in studies of English education. As for insights into learning, thinking, and motivational processes, a psychologist is certainly likely to have some good ideas; but the ideas are likely, at this point, to be hypotheses suggested for empirical examination rather than "facts" that would be immediately and clearly applicable to the classroom situation. Perhaps the most fruitful mode of interaction between psychologists and English educators lies in *joint* research, research aimed at both finding ways to increase the effective use of English and understanding the psychological processes involved in learning and using the language.

The Teaching of English and the Psychology of Thinking

Some Common Questions for Research

Most of these remarks have concerned the methods of psychological measurement rather than the substance of the processes to be measured. One of the most exciting current challenges for psychometrics is the measurement of complex cognitive processes. Any increase in our understanding of these processes promises benefit to the psychologist and the educator alike. Many of these areas of joint interest are being discussed more fully by others on the program. I should like to conclude by mentioning a few substantive questions for research regarding English education in which psychometrics could share a substantive as well as methodological role.

Order of learning.—That learning should proceed from simple to complex tasks or ideas seems to be a reasonable pedagogical principle. But how can one define the order of complexity of tasks or ideas? A good teacher does so by means of logic or intuition in developing a course. There are models that permit us to infer the order of psychological complexity on the basis of the pattern of intercorrelation among task performances.[4] Does this behavioral definition of order of complexity correspond to a logical one? If not, does one ordering offer a better order for learning than the other? Does either the logical or behavioral ordering provide an order of presentation of ideas more effective than, say, a random order? Such questions provide testable hypotheses for the kind of prototype experiment discussed earlier.

Who learns best.—Usually the best psychological predictor of success in learning English would be provided by a test of general intelligence, particularly the verbal items of the test. But there are individual differences in learning even among students who achieve identical test scores. It is possible that among students of high ability, certain styles or habits of thinking would be associated with variations in learning. An example of a style of thinking that has been investigated by psychologists is called "field articulation"—the tendency to respond analytically to any situation, to tease it apart and react to the separate parts.[5] It seems a reasonable hypothesis that among a highly able group of students, such a variable would distinguish those who learn English readily and use it effectively from those who do not. Another possibly relevant variable which has been studied by some psychologists is *cognitive complexity*—the number or diversity of concepts available to an individual for interpreting a given stimulus.[6]

Cognitive elements in writing style.—Finally, I would like to offer for discussion an intriguing question about thinking processes: What are the cues by which an individual decides to reject one way of saying something in favor of another way? This question I believe English teachers would call one of style. We may envision the process as a series of decisions about whether or not to produce certain responses. If we attempted to study all of the productions of responses in English communication, the model would be impossibly complex. Let us take a more limited question. Suppose we ask a number of good students to think aloud as they proofread their own work. When and where do they reject one approach in favor of another? Are decisions of this sort based upon relative frequency of occurrence of combinations of words in the person's experience? Upon rules? Upon remembered examples? Each alternative has both psychological and pedagogical significance.

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[4] Louis Guttman, "A New Approach to Factor Analysis: The Radex," *Mathematical Thinking in the Social Sciences*, Glencoe, Ill.: Free Press, 1954.

[5] Riley W. Gardner, et al., "Cognitive Control: A Study of Individual Consistencies in Cognitive Behavior," *Psychological Issues*, I, 1959.

[6] George A. Kelly, *The Psychology of Personal Constructs*, Vol. 1, New York: Norton, 1955.

Problems and Perils in Controlled Research in Teaching*

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I HAVE MISGIVINGS about this paper. As a student of college teaching, I am eager to have more research done, and I believe that even faulty experiments have a healthy effect upon a teaching staff. On the other hand, as a researcher in the field, I'd like research in this area done well; and after 16 years I'm not sure that I yet know how to do research on teaching. Nevertheless, I hope in this paper to help you avoid pitfalls into which I've stepped without making the path look so forbidding that you fail to venture upon it.

Many of the problems mentioned the past 2 days have been concerned with comparisons of two methods of teaching some aspect of English. Determining which of two teaching methods is more effective looks like a simple problem. Presumably all that is necessary is to teach something by one method and then to compare the results with those obtained by teaching the same thing by another method. This is essentially the research design of many of the studies widely quoted as showing the effectiveness of television, teaching machines, independent study or other techniques. Unfortunately there are pitfalls that enthusiasts for one method or another are likely to overlook.

Suppose, for example, that students are given an opportunity to take a class taught by some method quite unusual in their college. The very fact that the method is different gives it excitement. Sometimes the reaction may be one of enthusiasm; in other cases it may be one of outraged hostility. The latter reaction seems to be particularly likely when students taught by a new method know that they are competing on examinations with students taught by the tried and true traditional methods. In any case, as Dr. Forehand pointed out in his paper, it is difficult to know how much of student improvement (or loss) in learning may be accounted for by the emotional reaction to a new and different method and how much we can expect when the new method becomes routine.

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*Based on portions of the author's chapter in *The American College*, by Nevitt Sanford, New York: John Wiley and Sons, 1962.

Novelty has its effect on the professor as well as on his students. How many new curriculums, new courses, or new teaching methods have flowered briefly but then faded as the innovators' enthusiasm waned or as new staff members replaced the originators? Unfortunately, relatively few studies have made comparison over a period longer than one semester. Students who have experienced a semester of instruction by a new method (except television) are generally more likely to choose a section taught by this method than are students without previous experience.[1] This difference in motivation as well as added skill in the requisites of "studentmanship" in a new method might result in even greater advantages for a new method after two or more semesters of trial than after a single semester.

Thus the first problem in controlled research is in defining the experimental variable. Is it a teaching method *per se*, or is it the teaching method plus participation in an experiment?

When you begin to define teaching methods precisely, however, you will find that a number of variables differentiate them. You may feel that it is only the sum of these which really makes a difference. Nevertheless, don't go ahead with a global experiment lightly. Sometimes you can get much clearer results by taking one variable and studying its effect in a small experiment than by a big experiment including the kitchen sink.

A second methodological problem is that of establishing a suitable control group. We use a control group in order to make sure that some extraneous variables such as the mere passage of time, current cultural events, or taking a group of tests twice do not account for changes we observe between the beginning and end of a course. In some experiments a single instructor uses both teaching methods. Here the obvious problem is that it is difficult to determine how much the instructor's own personality and skills have influenced the outcome. We cannot know whether or not other teachers would obtain similar results. The remedy for this defect is to persuade several professors to use both methods. Leaving aside the salesmanship necessary to institute such a research design, the effort involved in trying to teach by two methods is tremendous. As a result, the methods either tend to coalesce or in an over-zealous attempt to avoid this, the experimenter institutes artificial and additional constraints to accentuate the differences. The result is that the intended comparison is not clear-cut.

Another problem in establishing controls is that the conditions of the experiment may introduce special factors which interfere with normal results. For example, the experiment may require extensive testing, the presence of observers in the class, or other interferences with normal classroom routine. A class in which a "live" professor is talking to television cameras is probably not a suitable comparison group for classes watching the lesson on television receivers.

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[1] Mabel Ashmus and G. Haigh, "Some Factors Which May Be Associated With Student Choice Between Directive and Non-Directive Classes," *American Psychologist*, VII, July 1952, p. 247 (Abstract).

What is the control group? It is not enough to say that the experimental class was compared with two classes taught by traditional methods. The experimenter must clearly demonstrate that the control class is different from the experimental classes in the variables he wishes to manipulate and not systematically different in other ways which may affect the results. This means that he must carefully describe the nature of the "traditional" methods used as controls.

A third problem, biased sampling, needs only brief mention. According to newspaper reports, studies of educational television have demonstrated that students taking a course at home learn as much as those on campus. The obvious problem is that people who sign up for a television course and come to campus to take the exam are probably somewhat different in motivation and background from typical college sophomores. As Greenhill points out, efforts to equate such groups are rarely successful.[2] This same judgment also applies to attempts to match individuals when part of a group fails to return a questionnaire or take a test.

Sampling problems are probably the most obvious source of difficulty in establishing a control group, and complicated matching devices are not very satisfactory methods of overcoming such a common difficulty as that of comparing a group who volunteered for an experimental section with those who remained in conventional classes.

Another problem is in the statistical methods used to analyze the results of experiments in teaching methods. Ordinarily in psychological research we are concerned about avoiding the type of error involved in concluding that one method is more effective than another when in reality they do not differ significantly. We are, however, less likely to be sensitive to another type of error which may be just as damaging in teaching methods research. This is the error of concluding that there is no difference in effectiveness when two methods are not found to differ significantly. In addition to the logical fallacy involved in accepting failure to disprove the null hypothesis as proof of no difference, there is the problem of choice of methods of analysis. The chance of obtaining such results depends upon the reliability of the tests and type of statistical analysis one uses. If one uses insensitive or unreliable tests, or "weak" statistics, a difference is unlikely to be detected. The true effect of a variable may be clouded if no effort is made to remove other sources of variance. Multivariate statistics (such as analysis of covariance) may, by taking out other sources of variance, reveal more clearly the true effects of varying methods. But in most of this research, obtaining negative results does not contribute much to our knowledge. We simply do not know whether there was no real difference or whether our measures and design weren't good enough to show differences which were really there.

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[2] Leslie P. Greenhill, "New Directions for Communication Research," *Audio-Visual Communication Review*, VII, Fall 1959, p. 245–253.

Closely related is the problem of dealing with interactions between teaching methods, student characteristics, teacher characteristics, goals and other variables. A method which is effective for the learning of some students may be ineffective for others in the same classroom. Ordinary group comparisons between teaching methods may thus hide very important differences in the effects of the methods upon particular types of students.

The most important problem in experimental comparisons of teaching methods is the criterion problem. Stuit and Wilson's prediction studies of naval training showed that as the criterion became increasingly well-defined, prediction of success improved.[3] Undoubtedly one of the reasons for the many non-significant differences in studies of teaching is poor criterion measures.

The criterion problem is further illustrated by the experiment of Parsons, Ketcham, and Beach.[4] To determine the effectiveness of various methods, they set up groups in which students did not come to classes at all. The groups who did not come to class did *best of all* on the final examination. The catch is that the examination was based entirely upon the textbook, and as the researchers point out, their results with the other groups suggest that the more new ideas and points of view are introduced, the less likely students are to remember what the textbooks say. This points to the problem of evaluation of effectiveness. If our goal is that students remember the textbook, a test on the textbook is appropriate, but we cannot conclude that a particular method is superior in achieving all goals, if we have measured only one goal. Note that we don't have to have agreement on the desirable outcomes of a course. The important thing is to have some indices of each type of outcome considered important by English teachers. We may then need to decide which type of outcome is most important. But this is a value question, not an empirical one.

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[3] Dewey B. Stuit and John T. Wilson, "The Effect of an Increasingly Well-Defined Criterion on the Prediction of Success at Naval Training School (Tactical Radar)," *Journal of Applied Psychology*, XXX, December 1946, p. 614–623.

[4] T. S. Parsons, W. A. Ketcham, and L. R. Beach, "Effects of Varying Degrees of Student Interaction and Student-Teacher Contact in College Courses." Paper read at American Sociological Society, Seattle, Washington: August 1958.

For purposes of research the degree of student motivation for good grades may make it very difficult to evaluate the effectiveness of two teaching procedures. Because passing or excellent grades are so important to them, students may compensate for ineffective teaching by additional study in order to pass the course examination at the level to which they aspire. Thus the effects of ineffective procedures may be masked or even misinterpreted when course examinations are used as criterion measures. Nachman and Opochinsky provided a neat demonstration of this when they found differences between a small and a large class on surprise quizzes but no difference on a final examination.[5] When significant differences in achievement are found in an experiment, the difference may simply reflect the degree to which students in differing classes were able to find out what the examination was to be and the degree to which it would determine their course grade. Or the differences may reflect the instructor's own biases in test construction and grading. If you use essay tests, be sure the grader does not know which papers come from which groups.

The difficulty in arriving at an overall index of teaching effectiveness is complicated by the probability that a teacher effective in achieving one course objective is not necessarily effective in achieving others. Bendig, for example, found a significant interaction between instructors and tests in an introductory psychology course.[6] Some instructors' students did particularly well on certain tests during the course but not well on other tests. Cross[7] and McKeachie[8] found that instructors whose students did well on an objective test in psychology were ineffective when their students' achievement was measured on an essay test designed to measure understanding and integration of the materials. In studies of teaching it is thus important to specify objectives and to use measures of each objective. Measures of retention after the end of a course would often add to one's confidence in reported differences.

Because achievement measures have been so insensitive to differences in teaching methods, most experimenters stress the favorable student reactions to the new method they have introduced. Although the relationship between student satisfaction and learning is low,[9] it can certainly be argued that, assuming equal learning between two methods, we would prefer to have students leave our classes with warm feelings about their experience. Moreover, we would expect this feeling to be related to interest in learning more, and there is some evidence to support this expectation.[10] When, however, we use student satisfaction as a criterion, we should be aware of the fact that it is highly influenced by students' role expectations of college teachers. Marked deviations from these expectations almost inevitably will be rated lower than more conventional teaching behavior. Laboratory studies of problem-solving groups reveal that authoritarian leaders are rated by group members as being more efficient than democratic leaders.[11] We expect leaders to take charge. Furthermore, when a leader plays an active role, the group is almost inevitably going to be more aware of his impact on them than of a leader whose behavior is more subtle. In evaluating student reactions, one therefore needs to be conscious of these role expectancies and to determine a proper base line against which to evaluate the reactions.

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[5] Marvin Nachman and Seymour Opochinsky, "The Effects of Different Teaching Methods: A Methodological Study," *Journal of Educational Psychology*, IL, October 1958, p. 245–259.

[6] A. W. Bendig, "Ability and Personality Characteristics of Introductory Psychology Instructors Rated Competent and Emphatic by Their Students," *Journal of Educational Research*, XLVIII, May 1955, p. 705–709.

[7] D. Cross, "An Investigation of the Relationships Between Students' Expressions of Satisfaction With Certain Aspects of the College Classroom Situation and Their Achievement on Final Examinations." Unpublished honors thesis, University of Michigan: 1958.

[8] W. J. McKeachie, *The Appraisal of Teaching in Large Universities*, Ann Arbor: University of Michigan Press, 1959, p. 32–36.

The prospective researcher also needs to be warned that even a careful definition of desirable outcomes does not end the criterion problem. In many cases, laudable attempts to measure attitudinal or affective outcomes have led to the conclusion that neither of two teaching methods was superior to the other in achieving this or that goal, when there is no evidence that *any* teaching could affect the goal as measured by the test used. At the very least, the experimenter needs to report some index of reliability; even better would be some evidence that the measure is at least sufficiently sensitive to reveal significant changes from the beginning to the end of the semester. If there is no change on a variable over a semester, it is unlikely that two teaching methods will differ in the amount of change they bring.

Finally, let us remind ourselves that evaluation need not end with tests given to the students who are enrolled in the experimental classes. In a large university it is easy to assume that an experimental course is assimilated into the whirlpool of activity without even a ripple. Seldom, however, has this assumption been tested, and in smaller colleges or large-scale innovations it is not a safe assumption. We might gain much useful knowledge by looking outside our experimental classrooms to other effects of the experiment. Do students taught by one method rather than another make more use of their knowledge and skills in other courses they are electing? Is superior achievement in the experimental course won at the expense of achievement in other courses? What is the impact of the use of a particular teaching method upon other faculty members? How does the use of a new method like television change faculty perceptions of teaching and its value; how does it affect faculty-administration relationships? In short, what effects does a new method have upon the total culture of the department or school?

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[9] Donald N. Elliott, "Characteristics and Relationships of Various Criteria of College and University Teaching," *Purdue University Studies in Higher Education*, LXX, March 1950, p. 5–61.

[10] W. L. McKeachie and Daniel Solomon, "Retention of General Psychology," *Journal of Educational Psychology*, XLVII, February 1957, p. 110–112.

[11] William Haythorn, Arthur Couch, Don Haefner, Peter Langham, and Launor Carter, "The Effects of Varying Combinations of Authoritarian and Equalitarian Leaders and Followers," *Journal of Abnormal and Social Psychology*, LIII, September 1956, p. 210–219.

The final pitfall is not one of experimental design so much as of human frailty. It is always tempting to run a big experiment and collect lots of data. In fact, the less one knows about what he wants, the more data he collects just to be sure he doesn't miss something important. But the more data collected, the less likely it is to be analyzed. One can simply be swamped by data. Before you give a single test, be sure you ask yourself, "How will I get this scored? What use will I make of the results?" I speak from the experience of one who right now has two files of unanalyzed data from old experiments.

These, then, are some of the pitfalls. I can't help you avoid all of the perils about which I've spoken, but at least I can reduce some fears about them. Probably the most important thing to get out of my talk today is that research is not easy. It requires special know-how which one cannot pick up in a conference or by reading a book. If you're planning research, begin by getting help from specialists in research design. There is little point in carrying out a research project which is designed in such a way that no conclusions can be drawn no matter how it comes out.

Now let us turn to some specific helps. First, let us consider the experimental variable-control group problems. Introducing the experimental variable may be difficult, but it is not impossible to control for some of the effects of extra attention and novelty which are likely to raise doubts about results. In the "Pyramid" experiments at Pennsylvania State University, control groups were also given special attention.[12] In place of the small group discussions, the control groups had special film series which were part of the experimental plan. This sort of control reduces the weight of an argument that the effects of the Pyramid plan were simply due to the extra attention students received.

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[12] C. R. Carpenter, "What Are the Most Effective Methods of Improving Instruction, with Special Reference to Individual Work Programs," *Current Issues in Higher Education*, Washington: NEA, 1959, p. 187–196; Robert H. Davage, *The Pyramid Plan for the Systematic Involvement of University Students in Teaching-Learning Functions*, 1958, and *Recent Data on the Pyramid Project in Psychology*, 1959, University Park: Division of Academic Research and Services, Pennsylvania State University.

Moreover, it is not usually necessary to hire specially trained observers to show that experimental and control groups differed as they were supposed to. Students can report on what their teacher does, and in some cases their perception of what he is doing is more important than that of observers.

Generally I would not worry too much about the presence of uncontrolled variables which may account for positive results if there are variables in teaching. Thus you need not be too concerned at this preliminary stage over the possibility that faulty sampling of biases in test scoring are responsible for positive results. In your experiments go ahead and use teachers who are enthusiastic about the new methods you want to use. Go ahead and sell your students on the great advantages of being in an experimental group. Your most probable outcome is "No significant difference." If you come out with a significant difference, you at least have shown that your measures are sensitive enough to show differences and that under ideal circumstances you can improve on what was done in your control group. With this as a basis, you are in a much better position to go on to pin down specific variables than if your original results had been negative. The only good effect of negative results is to squelch some of the wildest claims of the enthusiasts for the latest fad.

The sampling problem is sometimes difficult because we cannot always control student elections as we should wish. Nevertheless our statistical procedures are specifically set up to take into account differences between samples taken randomly. As long as there is no systematic difference between students in experimental and control groups, there is little reason to match each student in one group with a student in the other.

The problems of statistics and of interactions between student characteristics and teaching methods can be handled by use of more complex techniques of analysis. Fortunately computers permit us to carry out such analysis quickly and accurately, and most universities have specialists who can help with these problems. If they are to be of help, however, you must consult these experts before the experiment is conducted—not after the data have been collected.

The criterion problem will always be with us. But we can do better than we have. The lack of ideal measures of outcomes should not discourage us from using the best we have, and here again experts can be helpful. People like Paul Diederich of the Educational Testing Service are not only skilled in test construction but appreciate some of the subtleties that you'd like to evaluate. In many cases if you will spend some time with an evaluation expert, you will find that you can find evidence on some apparently immeasurable outcomes.

Finally let me reiterate my plea—"think small!" Don't spend your time and the Government's money on a big project until you have first pretested your experimental design and measures in a small study. Too much work in education today is called "research" simply because someone in a fund-granting agency wants teachers to do something different and the only respectable way to disguise a bribe to get them to do it is to call it "research." Now I would agree that we need innovation and I don't object to paying schools to try new things and to do some evaluation of the results. But let's not get confused about what we're doing.

The reason for research is to increase our understanding. Some scientists feel that they understand a phenomenon when they can describe it with some more or less parsimonious set of concepts. Others feel that they can only be sure they understand it if they can simulate it on a computer and produce the same results on the computer as were observed in reality. Dr. Reitman will describe in a later paper some of the beauty of this approach. Still other scientists are confident of their understanding only if they can use their concepts to predict phenomena. This is the traditional experimental method at which most of your discussion seems to be aiming.

These three types of understanding are related to your ability to convince others of the validity of your understanding. I hope you will aim toward prediction. Description and simulation, however, may be more feasible first steps toward understanding.

Controlled research on teaching can be done. It will never answer all of our questions definitely. But research can give us a better basis for the judgments we all must make. As we accumulate experience and facts we will gradually have better and better answers to the new problems to be faced in the decades ahead.

Innovations in English Teaching

PAUL B. DIEDERICH

College Entrance Examination Board
Educational Testing Service

EDUCATIONAL TESTING SERVICE and, in particular, its respected elder member, the College Entrance Examination Board, discovered in the thirties that it was hazardous to "dominate" the secondary school curriculum. It was also unnecessary, since we could predict success in college just as well by following what outstanding teachers said they were teaching as by telling them what to teach.

Ever since, we have followed a rigid policy of "hands off." Every one of our tests and examinations has been set and reviewed by a committee of outstanding school and college teachers. For that reason, you must not think that the innovations to be reported in this paper represent the ideas of ETS or of the College Board as to what the schools ought to be doing. The ideas, in every case, came from the schools; we just helped find the money to carry them out and, in some instances, to evaluate them. In a few cases I helped the schools to find solutions that worked; in far more, I helped them find solutions that did not work—but that is because I am a person, not because I am a representative of ETS.

By 1956 it was clear to us that many of our member schools were already in serious trouble, owing to the population explosion of the forties which was just then reaching high school. Our projections of population trends and of teacher supply showed that, during the entire decade of the sixties and for some years beyond, there would be far too many students in high school for the available classrooms and teachers. I worried about what would happen to the program in English composition when the student load per teacher exceeded 150. Mr. Henry Chauncey, our president, gave me a year to study this problem and suggested that I look into the possibility of using college-educated women with a major in English (or in a related field) to help English teachers correct papers during this crisis.

I reported to him that, whenever the student load per teacher rose above 150, the number of compositions assigned during the year shrank to about four. If more were assigned, there were usually only a check or a sentence fragment of comment. I could see no possibility of finding or preparing enough additional teachers in time to carry the extra burden.

On the other hand, I found more than enough superbly trained and interested college-educated housewives to carry us over the hump in all but a few communities in which the general level of education was quite low. I also found that the women were willing, if necessary, to do this work for nothing, but that administrators were unwilling to accept volunteer service. On the moral level, they thought that educational services ought to be paid for; on the practical level, they said that if the readers were volunteers, one had to accept whatever they did and like it, but if even a token payment were made, proper standards of grading, of getting papers back on time, etc. could be enforced. Hence the widespread use of readers to assist English teachers for a period of at least 10 years seemed inevitable.

I then wasted a year, as I see it now, preparing training materials for the new readers. These were 32 assignments on a variety of topics with four papers of different levels of merit on each topic corrected by experienced teachers. Almost as an afterthought, I prepared four tests for readers: a verbal ability test, a paper-grading test, a paper-correcting test, and an essay test of their own writing ability. The tests have since been widely used, but the training assignments have been almost completely ignored. I can now see what was wrong with them. First, they did not grow out of the assigned reading, since I could not assume that any particular book would be read in any given school. Second, they were over-corrected. My experienced teachers were so afraid of missing a mistake that they corrected everything. Seeing these voluminous corrections was a traumatic experience for the new readers; they did not have time for anything like them; and it would have been most unfortunate if they had. If a paper has 99 demonstrable errors, we now favor correcting four or five that the writer can be taught to avoid. No student can learn more than that from a single paper, especially when he is writing a paper a week, as he is doing in most schools that employ readers. Readers have also learned to say something good about every paper except those that were obviously written in haste and never corrected.

Readers are now selected in part by our four tests, but usually there are at least five times as many candidates who meet our standards as the school can possibly use. The final selection is then made by a scrutiny of credentials and by interviews with the principal and department head. When both readers and alternates have been selected, schools use various means of getting the teachers to know them and to indicate which they would accept as an assistant. Here some gentle administrative pressure may be applied. For example, a retired teacher with long years of experience may be assigned to a new teacher to break her in, but with the understanding that in any conflict of opinion, the teacher's decision must be final. A young reader who has never before corrected a student paper will usually be assigned to a veteran teacher.

Next, there is a series of briefing sessions, led by the department head and the most experienced teachers, on what they hope to teach about writing in each grade, the books on which assignments will be based, and typical student papers of different levels of merit. From that point on, the training of each reader is the primary responsibility of her teacher. For each assignment, she asks the reader to study the text on which the assignment was based, tells her what points to emphasize, and then goes over the first four or five papers on top of the pile to show the reader what grades she would assign and what points she would comment on. She also saves four or five papers from the last batch on which she did not agree with the reader. The discussion of these papers is by no means one-sided; often the teacher comes to agree with the reader. There must also be a great deal of reassurance that the reader is doing a superb job. In the overwhelming majority of cases, such reassurance is quite sincere; but teachers must not forget to give it.

Almost everyone now agrees that the most bracing effect of this procedure on teaching is the necessity of telling Mrs. Jones, when she comes in for her next batch of papers, what the assignment was *for*. Too many of us have fallen into the habit of assigning papers on anything that comes to mind without giving careful thought to the question of what this particular assignment is supposed to accomplish. We can no longer duck this question, for the readers always want to know what points the teacher wants emphasized. The habit of telling Mrs. Jones, "Pay particular attention to X" in this assignment leads naturally to telling the students, in their next assignment, to pay particular attention to Y. Thus there has come about at least a semblance of order and progression in our writing assignments. When teachers evade this repsonsibility, readers always complain of a lack of "leadership." Department heads know that what they refer to is teaching without any objective.

We now know of at least 200 school systems that must have employed readers, since they asked permission to reproduce our tests for that purpose. We do not know how many other school systems employed readers without using our tests. One possible study for the coming year is a questionnaire of a representative sample of schools to find out how widespread this movement really is. We can also get a sample of opinion as to its merits and shortcomings.

In our subsidized experimental year, 1959–60, we did an analysis of covariance on 16 school systems that were using readers and about half that number of comparable schools in the same regions that were not. As we predicted, we found no significant difference in growth between experimental and control schools. No one would expect that new readers would write so much better comments in their first year than experienced teachers that the experimental students would have an advantage that would show up in growth-scores. All that we hoped to prove was that teachers could be relieved of half or more of their impossible load of paperwork without handicapping their students. We found no such handicap in any of our 16 cities.

On looking back over the data now, however, after having just completed a factor analysis of judgments of writing ability, I suspect that our essay reading was too unreliable to reveal differences in growth-scores, even if true differences existed. I hope to replicate this experiment soon, using enough essays and readers to get a reliability of .90, with students who have had readers for 3 years as compared with students in classes of comparable size who have never had readers. The experimental schools might include two subgroups characterized by "direction" versus "lack of direction." I should be willing to bet that the first subgroup will do better than students who have never had readers, while the second subgroup will do worse, but the picture will be far from black and white. Some of our readers are so good that they need no direction, and some of our teachers are so good that no reader could possibly duplicate their performance. Still, I hope to find out what works best on the average and to isolate at least one of the variables that accounts for success in using readers. I shall control on verbal ability in grade 10; then simply compare mean scores on essays in grade 12. I shall avoid like the plague that difference between initial and final essays, because the reliability of a difference between two essay scores is bound to be so low that it will prove nothing.

I have frequently been asked to prove that using readers is superior to limiting the student load per teacher to 100 students. Why? I can see very little point in proving that something that will not be possible for many years to come is superior to something that is possible. We began using readers only when there weren't enough teachers, and we have fallen steadily behind population-growth since that time. Meanwhile, it may be significant that one wealthy school district with a per teacher load of 100 students and one private school with a per teacher load of 80 students have also adopted readers, because they found out that their teachers were not giving as much practice in writing as such loads would lead one to expect. Having Mrs. Jones come in for her batch of papers every Tuesday is a wonderful incentive toward getting them written.

After a school has been using readers for 3 or more years, it is almost forced to take note of the equally competent women who are sitting on the sidelines, yearning to get into the game. Our schools have found two other tasks, less demanding than the task of instruction, that these women can supervise just as well as teachers, if they are asked to work not more than two or three hours per school day, and if there are plenty of alternates to replace them whenever domestic crises interfere.

First, they can supervise "independent reading" in relatively large groups of about 70 students, given 2 student assistants to check books in and out. This "independent reading" is an actual substitute for 2 periods per week of English instruction in superior classes—not just a way of using up study periods. In most of our schools that have "independent reading" in grades 10 to 12 (chiefly in honors classes), there are only two class meetings in English per week. Hence these teachers can divide their present large classes into two sections of about 18 students each, asking section A to come to class on Monday and Tuesday, section B on Wednesday and Thursday. When they are not in class, they go to "independent reading" in a large room set aside for this purpose, with 1,200 to 1,800 carefully selected books, mostly paperbacks. These rooms are supervised by "English assistants," who are selected and trained by the school librarian in cooperation with the English department. Usually one team will supervise the independent reading room in the morning, another in the afternoon. For the present, we have had to use study halls for this purpose, since existing libraries could not handle the large number of additional students.

Some school librarians are still indignant that the English teachers have apparently set up a competing library under the supervision of lay people who do not hold a degree in library science. They fail to realize that this is an emergency measure, worked out not only with the consent and approval of librarians but with their active collaboration. In due course this situation will be regularized. Schools are now on the drawing boards that will have library facilities that exceed the wildest dreams of present librarians. It is assumed that the privilege of independent reading 2 periods a week will be extended not only to superior English classes but also to superior classes in social studies, science, and foreign languages. Studies conducted under the auspices of the Educational Facilities Laboratories of the Ford Foundation have shown that students react adversely to the monumental reading rooms that have been the showplace attraction of school libraries in the past. It is almost a general law that the amount of effective reading that gets done is inversely proportional to the size of the space in which it is done. Hence there will be large numbers of "carrels" for not more than four students scattered throughout the stacks, near offices of the librarians and their lay assistants. We do not expect students in one of these carrels to lodge a complaint against a fellow-occupant who starts to engage in horseplay, but the surrounding carrels *will*. Each will have a call-bell that may be set off whenever their studies are being disturbed. If the nearest assistant sees that call-bells are being set off on all sides of carrel 16, for example, she will race to that carrel, find out who is causing the disturbance, and eject him. It has become a regular rule with us that a student who is ejected from independent reading must make up that period as soon as possible in one of his free periods, since we regard independent reading as the central obligation of serious students. If a student is ejected very often, he is put into a class that does not have the privilege of independent reading.

Schools that have developed independent reading in English to the fullest possible extent find that most students read a book a week in this program. We have exercised very severe control over the selection of books for these rooms, so that we can honestly say that all are good literature, though some are easier than others. The few offensive titles that got into our list by mistake stir up so much trouble that they are removed in short order. We do not back down on every title, however, to which any parent objects. The committee in charge of the reading room considers all such objections, but its decision is generally taken to be final. It also tends to be conservative, since we do not want to wreck a fine program for the sake of a few titles when there are so many other works from which to choose.

Thus, there are two class meetings per week in English and two periods of independent reading. What happens on the fifth day? For the present, both sections of each class meet together that day to do programed exercises under the supervision of a qualified English assistant, while the teacher has that whole day free for conferences with individuals and small groups, both on what they have been reading and on what they have been writing. The full possibilities of this fifth day have not yet been realized, but the supply of printed programs (without hardware) is steadily increasing in quantity, quality, and interest. We have contributed a Vocabulary Program, of which I shall only say at this time that it is the largest program in existence and that the meaning of each word is built up by a multiplicity of contexts.

When I look at the schools that have readers, independent reading, and programed exercises all going at once, I notice a very substantial improvement in the lot of the high school English teacher. First, he has 10 class preparations per week rather than the usual 25. Second, he never meets a group of more than 20 students except on the rare occasions when he delivers a lecture, which may be to as many as 2,000 students in an auditorium or to any number of students on TV. Third, he has one day a week free of all class duties for conferences. This is the one feature of the work of college teachers that high school teachers have most neglected, simply because they have had no time for it. Fourth, most students are reading a book and writing a paper a week, but the teacher corrects only one-fourth of the papers; the reader corrects the rest. Fifth, he sees each section only twice a week, as college teachers do, so that students do not have time to get so heartily sick of him as they usually do in high school.

What is there left to do? I believe that these schools have pretty well solved the problem of *individual* reading (at least for superior students), but the program of *assigned* reading has fallen into confusion. Most of these schools no longer require their students to buy a general anthology; instead, they charge a book-fee to replenish the stocks of the independent reading rooms. Hence the old war-horses are no longer available. Teachers are glad to see them go, but they have agreed upon nothing to replace them as the common core of adolescent reading. It looks as though they chose their assigned books pretty much at random. In some cases their choices have been trivial; in no case do they add up to a sequential, comprehensive program in literature, interwoven with suggestions for essays.

How will works get into the new common core of adolescent reading? Possibly by the action of committees or commissions, but a commission takes about 5 years and usually cannot agree on anything in the end. Meanwhile I can think of a method of attacking this problem through research and development. In our subsection of the Research Division of ETS, we propose to prepare "teaching programs" on about 40 books, nominated by teachers whose judgment we respect, for each grade from grade 9 through grade 13. A "teaching program" differs from a "self-teaching program" in that, whenever the text is hard, the teaching program will ask a hard question, while the self-teaching program would break it up into about a dozen subquestions until the answer to the original question was obvious. There is a place for self-teaching both in remedial teaching and in the first attack on a new genre (as in Reid's admirable program on a poem by

Robert Frost). But for the common core of assigned reading in grades 9 to 13 we prefer "teaching programs," because literature does not break itself up into little steps for little feet, and students must ultimately learn how to deal with whatever problems it presents. Of course, on the hard problems, there will be differences of opinion, and these will be discussed in class.

After we have had about 40 "teaching programs" tried out by various teachers in each grade, we shall select between 20 and 30 that prove most successful (in terms of renewed orders) and publish them as a separate exercise-book for each grade. The texts are no longer a problem, since almost every work that anyone has nominated for the common core already exists in a paperback edition costing between 35 to 95 cents. We prefer students to buy their own, since an essential part of the habit of reading is the habit of buying. For needy students, the required program will naturally make available a large number of second-hand copies at low cost. We assume that, out of an average of 25 works for each grade programed in the exercise-books, teachers will assign an average of 15 to 18 (something like two a month) and will thus have a wide range of choice.

The "teaching programs" will make these works easy to teach, because most of the important questions will have been asked and considered by students in advance of each discussion, and the discussion itself will generate additional questions. I taught by this method for 3 years at the University of Chicago and found it easy, pleasant, and fruitful. It consists chiefly of calling on students who are raising their hands for permission to speak—and failing to recognize others who have already spoken. The less you tell them, and the more they argue out their differences with one another, the better.

Implications of Project Talent for Research in the Teaching of English

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Director of Project Talent

ONE OF THE objectives of Project Talent is to survey the level of performance with respect to various aspects of the use of the English language of a representative sample of students in all types of secondary schools in all sections of the country.

Newspaper reporters have concluded from preliminary reports of the results of this survey that "Johnny Can't Read But He Can Spell"; "High School Seniors Flunk Reading Test"; "Teeners Read Fine—If It's About Movies"; "Seniors Spell Better Than Read"; "12th Grader Good Speller, Poor Reader"; "High School Students Can't Write Grammatically."

Clearly, the purpose of this project is neither to "point with pride" nor to "view with alarm." Ours is primarily a descriptive function.

Before describing our findings, let us examine the general plans and procedures used in collecting these data. In this project we selected a stratified random sample of all of the secondary schools in the United States. This sample included 1,353 schools, or about 5 percent of all of the secondary schools. Since about 93 percent of the schools selected for the sample agreed to participate and various checks on subsamples indicate consistency among them, it can be concluded that we have, in fact, a representative sample of the country's high schools and their students.

With the help of four panels of distinguished experts, plans were developed for collecting extensive data on the aptitudes, abilities, achievement, interests, and background of these 440,000 students in grades 9, 10, 11, and 12. On the basis of these plans support for the first phases of the study was provided primarily by the Cooperative Research Program of the United States Office of Education. The tests required two school days. This discussion will refer only to the measures related to the field of English. Because it seemed desirable to keep the test battery within the self-imposed 2-day limit, some of the tests had to be rather short.

The tests of English included measures of literature, reading composition, vocabulary, spelling, punctuation, capitalization, English usage, effective expression, total English, and word functions in sentences. Table 1 gives the performance in terms of the means and standard deviations of high school students in grades 9, 10, 11, and 12 on the English tests used in Project Talent.

Perhaps the most obvious and noteworthy fact shown in table 1 is the consistent and substantial improvement from grade to grade shown for both boys and girls. The differences between the mean scores for grades 9 and 12 vary from a little more than one-third of a standard deviation for capitalization scores to almost one standard deviation for literature scores. For most of the English test score means, the difference between ninth and twelfth grades is about two-thirds of the standard deviation of the ninth-grade students. The small difference in capitalization scores is undoubtedly due to the fact that the average ninth-grade student answers about 85 percent of these questions correctly so that there is not much room for improvement on this task. The comparatively large difference in literature scores is probably due to the specific nature of these items which indicate primarily whether or not the student has read, understood, and remembered literary selections representative of those included in secondary school literature courses.

The other most noticeable fact from the data presented in table 1 is the generally better mean scores achieved by the girls in these classes on the subtests and total for the English test. The twelfth-grade mean scores for the girls on these tests are about one-half standard deviation higher than the corresponding mean scores for the boys. The differences between the mean scores of boys and girls are negligibly small in the twelfth grade for the literature and reading comprehension tests, and for the vocabulary test there is a difference of about one-third standard deviation favoring the boys.

These facts represent important data to be considered in planning research on secondary school English courses. However, the results expressed only in terms of raw scores are not very informative from a descriptive point of view. In order to provide a basis for more meaningful interpretation of these results, efforts were made to relate them directly to content. For example, the vocabulary test scores were related to the number of the word meanings given in the Merriam-Webster unabridged dictionary that are known to the average 12th-grade student. Similarly, the spelling test scores were related to the number of words in the 5,000 most frequently used words in the

English language, which, according to the Thorndike-Lorge *Teacher's Word Book*, can be spelled correctly by the average 12th-grade student. This was found to be 4,623 words or 92.5 percent of this list.

To aid in the interpretation of the reading comprehension test results, these scores were based on sample tests indicating the ability to comprehend two types of reading matter. The first type included periodicals. From among a number of selections from each of ten periodicals, two were chosen as representative of the paragraphs in that magazine. Questions were formulated to estimate the extent to which the reader understood these paragraphs. These questions emphasized the interpretation of the writer's broader ideas and the implications of these ideas rather than the simpler aspects of reading, such as understanding words or sentences.

According to this test the average 12th-grade student in the Nation's high school was able to answer correctly 78 percent of the questions based on paragraphs selected from *Modern Screen* or *Silver Screen*. On selections chosen from the *Saturday Evening Post*, *Look*, and the *Reader's Digest*, the average 12th-grade student answered correctly about half of the questions testing his ability to understand and interpret the paragraphs. This dropped to about 40 percent for *Pageant* and *McCall's* and to about 33 percent for *Time* and *Fortune*. For the remaining two periodicals, the *Atlantic Monthly* and the *Saturday Review*, the percentage of questions answered correctly by the average 12th-grade student was 28. Clearly there is much, even in some of the relatively popular magazines, that is beyond the level of reading comprehension attained by the graduates of our high schools.

The other type of reading material selected consisted of passages from the writings of well-known novelists. A procedure similar to the one just described was followed in choosing two selections which appeared to be typical of an author's writing. Questions were formulated to test the student's ability to understand and interpret these materials. The average 12th-grade student answered correctly 67 percent of the questions which tested their ability to comprehend selections from the novels of Louisa May Alcott and 58 percent from the novels of Robert Louis Stevenson. They answered correctly about half of the questions which were based on selections from the novels of Willa Cather, Sinclair Lewis, Jules Verne, and Rudyard Kipling. For the selections from the novels of Fyodor Dostoevesky and Joseph Conrad, they answered correctly about 40 percent of the questions, and for the selections from the novels of Jane Austen and Thomas Mann, 33 percent and 28 percent respectively. There was of course a wide range of ability shown by these 12th-grade students.

A small percent of the 12th-grade group made perfect scores, and a small percentage answered nearly all of the questions incorrectly.

Certainly the average 12th-grade student is unable to understand and interpret the ideas of the authors of many of the most widely read classical novels. Such findings as these have many implications for planning research projects to improve the English courses in the secondary schools. Meaningful points of reference of this type should be of great value in developing realistic objectives and selecting appropriate content for new courses.

Table 2 gives the results from analyzing representative samples of the answers to the questions on the various English subtests for 9th- and 12th-grade students. These samples are of such a size that the standard deviations for the distributions of percentages of the students selecting a particular choice would be expected to be between 1 and 2 percent if many such samples were tabulated.

In these results perhaps the most interesting finding is that in practically all cases more of the 12th than the 9th-grade students select the usage keyed as correct. It is of interest to note that items on which there was a difference of more than 20 percent favoring the 12th grade as compared with the 9th grade included: "15. Her sister is no ——— A. taller than her, B. *taller than she*, C. more tall than her, D. more tall than she"; and recognition that "marrage," "nesessary," and "contemperary" are incorrect spellings. Items which were missed by a substantial number of both 9th- and 12th-grade students and on which the difference between the two groups was less than 5 percent included the following:

10. It is ——— A. liable, *B. likely*, C. probable, D. going probably, E. almost sure going—to turn colder.

13. It was the ——— *A. furthest*, B. furtherest, C. fartherest, D. most far, E. farrest—anyone had gone.

18. Our visitor was Mr. Rogers; I hadn't expected it to be ——— A. he, *B. him*, C. himself, D. hisself.

23. Give these books to ——— A. they that, B. those whom, C. whomever, *D. whoever*, E. whomsover—you think would enjoy them.

43. The ——— *A. children's*, B. childrens', C. childrens—hats are in the closet.

60. The sun having come out in the meantime, they went to the beach, and several friends joined them there. A. partial sentence, *B. complete sentence*, C. two or more sentences.

87. . . . starring a popular *british* actor . . . *A. capitalized*, B. small.

Although there is considerable debate at the present time regarding the importance of teaching the mechanics of English expression, it seems quite important to have facts concerning the present knowledge and habits of secondary school students to use as a basis for planning research in the teaching of English.

Table 3 contains the distribution of mean scores for 12th-grade students on the English test in each of the 17 categories into which the 796 public senior high schools in the Project Talent sample were classified. It is clear that the mean scores on the English test are highest for urban schools serving students who come from areas in which moderate and high-cost housing is found. The lowest mean scores are for vocational schools and urban schools which serve students in low-income, low-cost housing areas in the 12 Southeastern states. There are not large differences in the medians for the other categories. The mean English test scores for schools in all four categories of the schools in Northeastern states tend to be uniformly high, and the corresponding scores for schools in the Southeastern states tend to be low but with a great deal of variability among the schools. The mean scores on the English tests for students in rural schools in all sections of the country compare quite favorably with the corresponding scores for schools in the towns and cities.

Another fact which should be of great importance for those planning research and development projects in the field of English is the tremendous variability within grades, within schools, and among schools. For example, the mean score on the English test for the students in one school in table 3 is at the first percentile in terms of the scores of all of the 12th-grade students throughout the country. Similarly, the mean score in another public school in table 3 is at the 88th percentile in terms of the scores of all of the country's 12th-grade students. Between 25 and 30 percent of the 9th-grade students throughout the country achieved higher scores on reading comprehension and English tests than did the average 12th-grade student. Any research which ignores these tremendous differences both among individuals and among schools must certainly be doomed to failure.

One final type of data collected in Project Talent may have some interest for those who are planning research in English instruction. The students were asked to write two short paragraphs. They were given 5 minutes to write a paragraph on the topic "My views about an ideal occupation." Following this they were asked to write a paragraph in another 5-minute period on "What high school means to me." These paragraphs are in the project files and only an exploratory analysis of a few hundred of them has been attempted to date. Brief and hurried as these samples of writing are, they appear to provide an opportunity for studying some of the more important aspects of communication skills. Perhaps as methods of evaluating written materials are developed through research, these techniques can be applied to the Project Talent paragraphs.

It is hoped that some of the facts of the type briefly discussed above may be useful in planning research on English instruction. Perhaps some of the techniques developed such as relating test scores to meaningful content will also be found to have applications in such research. Later analyses of items such as class size, teacher preparation, and instructional content in relation to student performance may provide additional guidance for research on the improvement of instruction in English.

Table 1.—Performance of students in grades 9 to 12 on English tests used in Project Talent, by mean and standard deviation (Subsample O—Unweighted raw score means)

Name of test	Number of items	Sex	Grade 9		Grade 10		Grade 11		Grade 12	
			Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
R-102 Vocabulary.	21	Boys	10.80	4.15	12.13	4.11	13.27	3.97	13.98	3.81
		Girls	9.76	3.98	10.98	4.06	11.78	4.09	12.66	4.06
R-103 Literature.	24	Boys	10.06	4.20	11.75	4.42	13.02	4.53	13.80	4.67
		Girls	9.78	3.85	11.51	4.21	12.59	4.38	13.81	4.71
R-231 Spelling	16	Boys	7.54	2.96	8.28	3.05	8.97	2.97	9.51	3.09
		Girls	9.03	2.81	9.72	2.73	10.38	2.69	11.09	2.66
R-232 Capitalization	33	Boys	27.53	4.90	28.40	4.52	29.07	3.97	29.41	3.93
		Girls	29.07	4.06	29.75	3.45	30.16	3.13	30.58	2.77
R-233 Punctuation	27	Boys	14.98	4.71	15.90	4.65	16.90	4.49	17.51	4.56
		Girls	16.95	4.54	17.90	4.44	18.78	4.29	19.64	4.19
R-234 English Usage	25	Boys	14.88	3.78	15.64	3.56	16.35	3.37	16.96	3.47
		Girls	16.02	3.21	16.76	3.11	17.27	3.08	17.92	3.05
R-235 Expression	12	Boys	7.24	2.60	7.84	2.60	8.49	2.37	8.98	2.27
		Girls	8.06	2.27	8.64	2.18	9.07	2.06	9.48	1.96
R-230 English Total	113	Boys	72.16	15.14	76.07	14.59	79.79	13.37	82.36	13.74
		Girls	79.14	13.04	82.77	12.39	85.67	11.66	88.71	11.47
R-240 Word Functions	24	Boys	7.92	4.54	8.89	5.03	9.69	5.13	10.13	5.19
		Girls	9.05	5.08	10.38	5.49	10.97	5.50	11.63	5.57
R-250 Reading Comprehension	48	Boys	23.99	11.14	27.40	11.10	30.64	10.69	32.67	10.35
		Girls	25.64	10.33	28.89	10.17	30.99	9.91	33.28	9.42
Number of cases:										
Boys			3,915		3,846		3,619		3,027	
Girls			3,864		3,727		3,557		3,061	

Table 2.—Proportion of students answering each choice in the various English tests used in Project Talent

(Grades 9 and 12)

Part I: English Usage

Directions: You will be given a number of sentences which have some words missing. A blank appears wherever a word or group of words is missing. For each blank, several choices are given which could go into the blank. You are to pick the choice which would fill the blank *best*. If two choices for a blank are correct, select the one you think is *better* and mark the answer space for that choice on your answer sheet. Here is a sample item:

S1. He ——— ready yet.
A. isn't
B. ain't
C. aren't

Since "isn't" is the word that best fits the blank, answer space A has been marked on the answer sheet for sample item S1.

Begin now.

Grades		
9	12	
		1. An epidemic ——— out.
20	15	A. had broke
2	1	B. had breaked
71	80	*C. had broken
7	4	D. was broken
0	0	E. breaked
—	—	
0	0	
		2. He ——— me how to play tennis.
4	2	A. learned
1	0	B. learnt
5	3	C. teached
90	94	*D. taught
—	—	
0	0	
		3. You ——— take care of that blister.
3	1	A. should ought to
5	2	B. had ought to
34	33	C. better
57	63	*D. had better
2	1	E. better had
—	—	
0	0	

Grades		
9	12	
		4. She is ——— pretty.
10	4	A. kind of
5	2	B. sort of
85	94	*C. rather
—	—	
0	0	
		5. I've read ——— all his books.
9	9	A. most
14	6	B. mostly
2	3	C. most nearly
1	0	D. most near
74	82	*E. almost
—	—	
0	0	
		6. Please bring me ——— magazines.
2	0	A. them
1	0	B. them there
95	99	*C. those
2	0	D. those there
—	—	
0	0	
		7. Tomorrow both Ed and his brother ——— to study.
1	1	A. got
11	9	B. has
52	58	*C. have
6	3	D. has got
29	29	E. have got
—	—	
0	0	
		8. Some animals can swim ———.
29	20	A. extremely rapid
1	1	B. real fastly
3	2	C. real fast
2	2	D. very fastly
66	75	*E. very fast
—	—	
0	0	
		9. They ——— anything else.
65	80	*A. could hardly have done
22	13	B. couldn't hardly have done
8	5	C. could hardly have did
5	2	D. couldn't hardly have did
—	—	
0	0	

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Table 2.—Proportion of students answering each choice in the various English tests used in Project Talent—Continued

Grades 9	Grades 12	
		10. It is ——— to turn colder.
20	22	A. liable
74	75	*B. likely
4	2	C. probable
1	1	D. going probably
1	0	E. almost sure going
0	0	
		11. Neither Mary ——— went.
13	7	A. or him
19	13	B. nor him
20	21	C. or he
47	59	*D. nor he
0	0	
		12. He ——— he should.
61	71	*A. doesn't behave as
30	25	B. doesn't behave like
5	3	C. don't behave as
4	1	D. don't behave like
0	0	
		13. It was the ——— anyone had gone.
45	49	*A. furthest
17	19	B. furtherest
26	27	C. fartherest
1	2	D. most far
10	3	E. farrest
0	0	
		14. Neither of them ——— there yet.
4	2	A. had went
55	53	B. have gone
5	3	C. has went
6	3	D. have went
30	39	*E. has gone
0	0	
		15. Her sister is no ———.
37	20	A. taller than her
51	72	*B. taller than she
6	3	C. more tall than her
6	5	D. more tall than she
0	0	

Grades 9	Grades 12	
		16. I like the idea of ——— coming here.
3	3	A. they
67	51	B. them
25	45	*C. their
1	0	D. them theirselves
4	1	E. they themselves
0	0	
		17. You will play the piano ——— if you practice.
2	1	A. more well
1	0	B. more good
2	0	C. weller
90	98	*D. better
5	1	E. more better
0	0	
		18. Our visitor was Mr. Rogers; I hadn't expected it to be ———.
13	16	A. he
77	80	*B. him
7	3	C. himself
3	0	D. hisself
1	0	
		19. I didn't ——— books from the library yesterday.
93	97	*A. borrow any
3	1	B. borrow no
2	2	C. loan any
1	0	D. loan no
1	0	E. lend no
1	0	
		20. The delay probably bothers you more than ——— I am in no hurry.
13	5	A. me, on account of
58	72	*B. me, since
7	3	C. I, on account of
21	19	D. I, since
1	0	
		21. A pile of pebbles ——— near the brook.
15	13	A. laid
37	49	*B. lay
32	25	C. were lying
12	11	D. was laying
2	1	E. was lain
1	0	

Table 2.—Proportion of students answering each choice in the various English tests used in Project Talent—Continued

GRADES		
9	12	
		22. I want ——— to stay.
16	16	A. you and he
2	1	B. for you and he
74	79	*C. you and him
7	4	D. for you and him
—	—	
1	0	
		23. Give these books to ——— you think would enjoy them.
1	0	A. they that
22	11	B. those whom
35	47	C. whomever
37	38	*D. whoever
4	3	E. whomsoever
—	—	
1	1	
		24. The chairman requested that everyone ——— comments brief.
15	6	A. keeps their
39	36	B. keep their
14	12	C. keeps his
30	46	*D. keep his
—	—	
2	1	
		25. The car would run better if it ——— tuned up.
41	56	*A. were
40	34	B. was
6	3	C. would be
4	3	D. is
7	3	E. would have been
—	—	
2	1	

Go on to the next part.

PART II: EFFECTIVE EXPRESSION

Directions: In each item of this test the same idea is expressed in several ways, and you are to choose the way you think is best. Mark the letter of the sentence you think is best on your answer sheet. BEGIN NOW.

GRADES		
9	12	
		26.
13	7	A. Tests have been suggested to be given at regular intervals as a check on the students' progress.
12	5	B. It has been suggested that checks at regular intervals should be made of students' progress by giving tests.
6	2	C. That tests be given at regular intervals as a check on the students' progress has been suggested.
69	86	*D. It has been suggested that tests be given at regular intervals as a check on the students' progress.
—	—	
0	0	
		27.
60	79	*A. When he is alone, he is lonely; in a crowd he is even lonelier.
16	9	B. He is even lonelier in a crowd than when he is alone, when he is also lonely.
24	12	C. Even more so than he is lonely when he is alone, he is lonely when he is in a crowd.
—	—	
0	0	
		28.
21	24	A. We fought hard, nevertheless we lost by three runs.
18	12	B. After a valiant tenacious struggle, we succumbed, losing the game by three runs.
4	3	C. Hard we fought but lose we did—by three runs.
6	3	D. By three runs we were defeated, after we fought hard.
51	59	*E. We fought hard but we lost by three runs.
—	—	
0	0	
		29.
9	4	A. We should consider, perhaps, each aspect of the problem and then make the decision finally.
15	9	B. Consideration of each aspect of the problem separately should perhaps precede our making of the final decision.

Table 2.—Proportion of students answering each choice in the various English tests used in Project Talent—Continued

Grades			
9	12		
76	87	*C.	Perhaps we should consider each aspect of the problem separately before making the final decision.
0	0		
		30.	
50	66	*A.	In some cases it may be necessary to ask for more money to meet emergencies.
13	9	B.	Asking for more money to meet emergencies may sometimes be needed.
8	4	C.	On occasion more money to meet emergencies may need to be asked for.
20	21	D.	Upon occasion it may be found necessary to issue requests for supplementary funds to contend with unexpected eventualities.
0	0		
		31.	
78	91	*A.	He needs a new boat about as much as he needs a private rocket to the moon.
4	2	B.	Like a private rocket to the moon he needs a new boat.
18	7	C.	His need for a new boat is about like for a private moon rocket.
0	0		
		32.	
4	2	A.	Accomplishment of the completed job was quick.
31	23	B.	Completion of the job was accomplished quickly.
65	75	*C.	The job was completed quickly.
0	0		
		33.	
4	2	A.	Everyone in the room's talking stopped suddenly.
9	4	B.	The talking by everyone in the room suddenly stopped.
87	94	*C.	Suddenly everyone in the room stopped talking.
0	0		

Grades			
9	12		
		34.	
7	2	A.	Basing it on the reports he read, a decision could be reached by him.
48	61	*B.	On the basis of the reports he read, he was able to reach a decision.
45	36	C.	Based on the reports he read, he was able to reach a decision.
1	1		
		35.	
10	6	A.	It was the first time we had, after all, been to Paris, so we acted like tourists and who could blame us for doing this?
78	90	*B.	After all, it was the first time we had been to Paris, and if we acted like tourists who could blame us?
13	4	C.	It being, after all, the first time we had been to Paris, if we acted like tourists should we be blamed?
1	0		
		36.	
68	78	*A.	Coming into the room hurriedly and not watching where he was going, Tommy accidentally knocked over his mother's vase.
15	14	B.	Tommy, coming into the room hurriedly, knocked over his mother's vase accidentally, because he wasn't looking where he was going.
16	8	C.	Coming into the room hurriedly and not watching where he was going, his mother's vase was accidentally knocked over by Tommy.
1	0		
		37.	
10	4	A.	We wondered, because for fifteen days Jim had endured hardship and fatigue without complaint, if anything could exasperate him.

Table 2.—Proportion of students answering each choice in the various English tests used in Project Talent—Continued

GRADES 9	GRADES 12	
52	64	*B. We wondered whether anything could exasperate Jim, who had endured fifteen days of hardship and fatigue without complaining.
38	31	C. For fifteen days Jim had endured hardship and fatigue without complaining, so we wondered if anything could exasperate him.
—	—	
0	1	

Go on to the next part.

Part III: PUNCTUATION

Section a—Punctuation marks

Directions: In this test you will be shown some sentences in which some punctuation may be missing. Below each sentence there are several possible ways in which a certain part of the sentence could be punctuated. Only one of these ways is correct. Your task is to decide which is the correct way of punctuating that part of the sentence, and mark the letter space on your answer sheet which matches your choice.

Here is a sample item:

S1. What a wonderful surprise

A. surprise.
B. surprise!
C. surprise?

The choices A, B, and C show three possible ways of punctuating this sentence. The statement is an exclamation, so it must be followed by an exclamation mark. This is choice B. The answer, B, has been marked on the separate answer sheet for sample item S1.

Here is another sample item:

S2. Has anyone seen Mr Adams

A. Mr Adams.
B. Mr Adams?
C. Mr: Adams?
D. Mr. Adams.
E. Mr. Adams?

In this sample item, there should be a period after "Mr", since it is an abbreviation. Since the item is a question, it should end with a question mark. Among the five choices for punctuating this part of the sentence, only E has a period after Mr. and a question mark after Adams. Answer space E has been marked for this sample item on the answer sheet.

GRADES 9	GRADES 12	
		38.
		The 815 AM train is ten minutes late today.
2	0	A. 8 15 A M
1	0	B. 8-15 A.M.
1	0	C. 8'15" A.M.
95	98	*D. 8:15 A.M.
1	0	E. 8-15 A M
—	—	
0	0	
		39.
		Charge roared the captain.
3	1	A. Charge:
9	7	B. "Charge."
85	92	*C. "Charge!"
3	0	D. Charge.
—	—	
0	0	
		40.
		Pass the sugar please
15	15	A. sugar, please?
5	3	B. sugar; please.
15	12	C. sugar please?
64	69	*D. sugar, please.
—	—	
0	0	
		41.
		When will you be back Jim
4	1	A. back, Jim.
31	27	B. back Jim?
65	72	*C. back, Jim?
—	—	
0	0	
		42.
		Like virtue its its own reward.
15	10	A. virtue, its it's
8	4	B. virtue its' it's
48	64	*C. virtue, it's its
20	19	D. virtue, it's its'
8	3	E. virtue its it's
—	—	
1	0	

Table 2.—Proportion of students answering each choice .n the various English tests used in Project Talent—Continued

43.

The childrens hats are in the closet.

GRADES 9	GRADES 12	
48	48	*A. children's
40	45	B. childrens'
12	6	C. childrens
—	—	
0	1	

44.

The Detroit Chicago flight is very short.

GRADES 9	GRADES 12	
4	1	A. Detroit Chicago
3	3	B. Detroit: Chicago
34	21	C. Detroit, Chicago
4	2	D. Detroit; Chicago
55	73	*E. Detroit-Chicago
—	—	
0	0	

45.

This is the route north on 23rd St. four blocks to Main, and then turn left.

GRADES 9	GRADES 12	
52	31	A. route, north
23	43	*B. route: north
25	26	C. route; north,
—	—	
0	0	

46.

I am enclosing twenty five 25 cents.

GRADES 9	GRADES 12	
10	6	A. twenty five-25-cents
53	66	*B. twenty-five (25) cents
2	1	C. Twenty: five (25) cents
19	17	D. twenty five (25) cents
16	10	E. twenty-five "25" cents
—	—	
0	0	

47.

"Who wrote The Raven the teacher asked.

GRADES 9	GRADES 12	
26	43	*A. 'The Raven'?"
25	19	B. "The Raven,"
38	32	C. "The Raven?",
5	6	D. 'The Raven?',
6	1	E. The Raven?,
—	—	
0	0	

48.

Be here by three oclock if you can.

GRADES 9	GRADES 12	
4	1	A. o"clock
4	2	B. o clock
83	92	*C. o'clock
2	2	D. o-clock
7	3	E. o:clock
—	—	
0	0	

49.

Bring paper pencils and scissors to class.

GRADES 9	GRADES 12	
3	1	A. paper pencils and scissors,
76	84	*B. paper, pencils, and scissors
8	7	C. paper, pencils and scissors,
2	1	D. paper; pencils; and scissors
12	7	E. paper, pencils, and scissors,
—	—	
0	0	

50.

Twas the night before Christmas" is the first line of a long poem.

GRADES 9	GRADES 12	
3	2	A. ' "Twas
44	50	B. "T'was
27	18	C. "Twas
18	27	*D. " 'Twas
8	4	E. 'T'was
—	—	
0	0	

51.

The fishermen caught a wall eyed pike and two perch.

GRADES 9	GRADES 12	
39	58	*A. wall-eyed pike
9	5	B. wall eyed pike
36	29	C. wall-eyed pike,
16	7	D. wall eyed pike,
—	—	
0	0	

52.

The twins were born on a rainy Wednesday September 4 1935

GRADES 9	GRADES 12	
76	84	*A. Wednesday, September 4, 1935.

Table 2.—Proportion of students answering each choice in the various English tests used in Project Talent—Continued

Grades 9	Grades 12	
12	10	B. Wednesday September 4, 1935.
3	1	C. Wednesday, September 4 1935
7	5	D. Wednesday, September, 4, 1935.
2	0	E. Wednesday September 4– 1935
—	—	
0	0	

Grades 9	Grades 12	
		53.
		Here here dont do that.
4	1	A. Here-here, dont
20	20	B. Here here, don't
8	3	C. Here, here, dont
8	8	D. Here here don't
60	68	*E. Here, here, don't
—	—	
1	0	

Directions Each item in this section of the test is either part of a sentence, or one complete sentence, or two or more sentences run together. For each item mark your answer sheet as follows to show your choice:

Mark "0" if it is part of a sentence.
Mark "1" if it is one complete sentence.
Mark "2" if it is two or more sentences run together.

Begin now.

Choosing each response:

Grades	0	1	2	
9th	13	56	*30	54. Taste it, it is very good. Taste it. It is very good.
12th	7	55	*38	
9th	*77	16	5	55. They hoped that if it were true.
12th	*89	8	2	
9th	26	*70	4	56. Stop that.
12th	14	*86	0	
9th	3	13	*84	57. It is impossible to tell what you mean if you keep mumbling, if you want me to understand your point, speak up about it. It is impossible to tell what you mean if you keep mumbling. If you want me to understand your point, speak up about it.
12th	0	9	*90	
9th	3	30	*67	58. A free demonstration will be given at any time, you may also write for information. A free demonstration will be given at any time. You may also write for information.
12th	2	20	*77	
9th	5	*61	33	59. Several faculty members will instruct students in etiquette, proper dress, and how to write a letter, the school announced yesterday.
12th	4	*73	23	
9th	12	*34	53	60. The sun having come out in the meantime, they went to the beach, and several friends joined them there.
12th	14	*29	57	
9th	33	*65	2	61. He left it behind.
12th	19	*81	0	

Table 2.—Proportion of students answering each choice in the various English tests used in Project Talent—Continued

GRADES				
9th	*87	8	4	62. Having gone most of the way by foot.
12th	*97	2	0	
9th	*57	28	14	63. When the weather gets warmer and the days become longer, but not until then.
12th	*73	17	9	
9th	4	52	*43	64. Why don't they make the trip together, it would be fun for both of them. Why don't they make the trip together. It would be fun for both of them.
12th	1	49	*49	

Part IV: SPELLING

Directions: Each item in this test contains four words, one of which *may* be misspelled. Look at all four words, and if you find one that is misspelled, mark that answer space on your answer sheet. If all four words are spelled correctly, mark answer space E (None of the above) on your answer sheet for that item. There is never more than one misspelled word in any one item.

Sample items:

S1. A. dog
B. pen
C. kat
D. paper
E. None of the above

S2. A. hat
B. fish
C. nine
D. cup
E. None of the above

In the first sample item, C is the answer since "cat" is misspelled. C has been marked for sample item S1. In the second sample item, E is the answer since none of the words is misspelled. E has been marked on the answer sheet.

Begin now.

GRADES

9	12	65.
4	1	A. bureau
2	1	B. tomorrow
2	1	C. hello
85	94	*D. pianoe
7	4	E. None of the above
0	0	

GRADES

9	12	66.
6	3	A. separate
1	0	B. lawyer
2	0	C. busy
83	91	*D. chooze
7	5	E. None of the above
0	0	

9	12	67.
6	1	A. baggage
59	82	*B. marrage
6	4	C. carriage
3	1	D. message
26	12	E. None of the above
0	0	

9	12	68.
54	80	*A. nesessary
4	1	B. excess
12	3	C. access
11	5	D. possess
18	11	E. None of the above
1	0	

9	12	69.
2	0	A. knowledge
2	0	B. bridge
78	93	*C. colledge
1	0	D. judge
17	6	E. None of the above
0	0	

9	12	70.
10	8	A. occurred
1	0	B. weight
17	14	C. superintendent
6	3	D. physician
66	75	*E. None of the above
0	0	

Table 2.—Proportion of students answering each choice in the various English tests used in Project Talent—Continued

GRADES		
9	12	
		71.
6	5	A. forty
6	9	B. ninety
26	18	C. twelfth
1	0	D. fifth
61	68	*E. None of the above
—	—	
0	0	
		72.
14	5	A. alien
48	67	*B. peculier
14	9	C. meridian
3	1	D. familiar
21	18	E. None of the above
—	—	
0	0	
		73.
5	3	A. irregular
12	16	B. recommend
27	21	C. embarrass
5	2	D. rebellion
51	58	*E. None of the above
—	—	
0	0	
		74.
7	4	A. descend
22	8	B. discern
33	52	*C. liscense
19	12	D. ascertain
19	24	E. None of the above
—	—	
0	1	
		75.
10	10	A. rhythm
14	3	B. consumption
4	2	C. column
40	55	*D. hankerchief
32	30	E. None of the above
—	—	
0	0	

GRADES		
9	12	
		76.
44	57	*A. neice
4	4	B. scientist
8	4	C. seize
13	13	D. mischievous
30	23	E. None of the above
—	—	
1	0	
		77.
36	21	A. formidable
24	44	*B. desireable
3	1	C. acceptable
3	2	D. invisible
33	32	E. None of the above
—	—	
1	0	
		78.
22	17	A. laborer
27	46	*B. burgler
4	3	C. grammar
3	1	D. popular
43	33	E. None of the above
—	—	
1	0	
		79.
42	27	A. monetary
4	2	B. dictionary
24	45	*C. contemperary
4	1	D. primary
25	25	E. None of the above
—	—	
1	0	
		80.
20	27	*A. lizzard
8	6	B. apparent
22	17	C. suppress
3	2	D. balloon
46	48	E. None of the above
—	—	
1	0	

Go on to the next part.

Table 2.—Proportion of students answering each choice in the various English tests used in Project Talent—Continued

PART V: CAPITALIZATION

Directions: In this test you will be given a paragraph to read. There will be numbers printed beneath certain words. You should decide whether each numbered word should begin with a capital letter or a small letter. If it should begin with a capital letter, mark answer space C for that number on your answer sheet. It if should begin with a small letter, mark answer space S on your answer sheet for that item.

Begin now.

C—capital S—small O—omitted item

Item Number	*Percent correct by grades*		*Percent choosing each option:*					
			Grade 9			*Grade 12*		
	9	12	C	S	O	C	S	O
81	98	99	98	2	0	99	1	0
82	92	95	92	8	0	95	5	0
83	97	99	97	3	0	99	1	0
84	97	98	2	97	1	1	98	1
85	86	97	86	14	0	97	3	0
86	81	95	81	18	1	95	5	0
87	82	83	82	18	0	83	17	0
88	87	94	13	87	0	6	94	0
89	92	97	8	92	0	3	97	0
90	92	97	7	92	1	3	97	0
91	78	91	78	22	0	91	9	0
92	89	93	11	89	0	6	93	1
93	98	99	98	2	0	99	1	0
94	89	90	89	11	0	90	10	0
95	77	88	77	22	1	88	12	0
96	97	99	97	3	0	99	1	0
97	96	98	96	4	0	98	1	1
98	89	93	11	89	0	7	93	0
99	89	93	11	89	0	7	93	0
100	89	95	11	89	0	5	95	0
101	95	97	95	5	0	97	3	0
102	59	70	59	40	1	70	30	0
103	89	94	89	11	0	94	6	0
104	92	95	8	92	0	5	95	0
105	78	90	22	78	0	10	90	0
106	80	92	20	80	0	8	92	0
107	92	97	7	92	1	3	97	0
108	87	94	12	87	1	6	94	0
109	47	49	52	47	1	51	49	0
110	95	99	95	4	1	99	1	0
111	85	90	14	85	1	10	90	0
112	95	97	95	4	1	97	3	0
113	39	56	60	39	1	44	56	0

on sunday october 18 a picture
*81 *82 *83 84

entitled "far from here" star-
*85 *86

ring a popular british actor, an
*87 88

idol of millions of teen-agers,
89 90

opened at the palace, the new
*91

theater about two blocks from
92

the mississippi river. the huge
*93 *94 *95

turnout for the picture surprised
mr. johnson, the theater mana-
*96 *97 98 99

ger, who remarked to his brother
100

george, "do you know, i've
*101 *102 *103

never seen a crowd like this
before," and then, gazing at the
104

line of hero-worshippers that
105 106

already stretched down the street
107

from the box-office all the way
to the river, he added thought-
108

fully, "not even in chicago last
109 *110

winter during the christmas
111 *112

holidays."
113

Table 3.—Distribution of grade 12 means for public schools in 17 classifications on the English test of Project Talent

English total (Raw score mean)	Voca-tional	Largest cities		Large cities		Northeast				Southeast				Midwest and West				Total
	10*	21*	22*	31*	32*	41*	42*	43*	44*	51*	52*	53*	54*	61*	62*	63*	64*	
		Low cost	Moderate to high	Low cost	Moderate to high	Urban low cost	Urban moderate to high	Towns	Rural	Urban low cost	Urban moderate to high	Towns	Rural	Urban low cost	Urban moderate to high	Towns	Rural	Total
97.50 to 100.50			1															1
94.50 to 97.50			1													1		2
91.50 to 94.50		1	5		2		6	2	2		1	1	2		2	3	4	31
88.50 to 91.50		1	10		4		13	3	3	2	9	2	4	1	22	12	7	93
85.50 to 88.50		1	17	2	4	2	20	9	8	2	13	10	10	3	25	34	21	181
82.50 to 85.50	1	6	12	1	3	2	5	12	4	2	11	10	26	3	21	39	36	194
79.50 to 82.50	1	5	3	2	5		2	2	2	1	4	6	10		6	27	28	104
76.50 to 79.50	6	4	3				1	2	2	2		4	16			10	15	65
73.50 to 76.50	6	2	1	2				1			1	2	6	1		4	7	33
70.50 to 73.50	5	5			2					3	2	1	5	1		2	4	30
67.50 to 70.50	6									4	1	2	6			2		21
64.50 to 67.50	4	2								3		1	7					17
61.50 to 64.50										2			3		1		1	7
58.50 to 61.50	2									1	1	1						5
55.50 to 58.50	1											2						3
52.50 to 55.50										1			1	1		1	1	5
49.50 to 52.50	1																1	2
46.50 to 49.50													1					1
43.50 to 46.50	1																	1
Total	34	27	53	7	20	4	47	31	21	23	43	42	97	10	77	135	125	796
Median	71. 7	79. 8	86. 8	81. 8	85. 5	85. 5	87. 8	85. 1	86. 4	71. 0	85. 8	83. 1	80. 6	84. 5	86. 8	84. 2	83. 0	84. 1

*Code for school categories

10. All vocational schools. (Nonvocational high schools: General comprehensive, academic or college preparatory, university, and superior student schools)
21. Cities A (1,500,000)—low-cost housing and low income
22. Cities A (1,500,000)—moderate and high-cost housing
31. Cities B (250,000 to 1,499,999)—low-cost housing and low income
32. Cities B (250,000 to 1,499,999)—moderate and high-cost housing
41. Regions 1 and 2—urban (5,000 to 249,999) low-cost housing and low income
42. Regions 1 and 2—urban (5,000 to 249,999) moderate and high-cost houring
43. Regions 1 and 2—small-town
44. Regions 1 and 2—rural
51. Region 5—urban, low-cost housing and low income
52. Region 5—urban, moderate and high-cost housing
53. Region 5—small-town
54. Region 5—rural
61. Regions 3, 4, 6, 7, 8, 9—urban, low-cost housing and low income
62. Regions 3, 4, 6, 7, 8, 9—urban, moderate and high-cost housing
63. Regions 3, 4, 6, 7, 8, 9—small-town
64. Regions 3, 4, 6, 7, 8, 9—rural

Regions 1 and 2 consist of the Northeastern States (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, and District of Columbia)

Region 5 consists of the Southeastern States (Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, and Louisiana)

Regions 3, 4, 6, 7, 8, 9 consist of the Midwestern and Western States (all other States not named above)

Computer Models of Psychological Processes and Some Implications for the Theory and Practice of Education

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RECENT DEVELOPMENTS in the use of high-speed digital computers may be divided very roughly into two groups, corresponding to two of the most salient features of the computers themselves: (1) their speed, accuracy, and efficiency in handling numbers, and (2) their flexibility as general symbol manipulating devices. This paper focuses on some developments which fall under the second of these two headings.

I do not mean to discount in any way the invaluable contributions computers now make and increasingly will come to make in studies of the educational process by virtue of their speed and efficiency. They are essential to the analysis of data in any large-scale research project, and they can lighten significantly some of the more laborious aspects of related scholarly investigations, e.g., of the statistical aspects of language. But the usefulness of computers in these activities is now widely known and generally accepted. The potentialities inherent in the computer as a symbol manipulating device are much less generally understood, although they may well prove to be of at least equal importance to those in the teaching profession as a consequence of their application in explorations of the psychological bases of thought and speech.

The main impetus for the class of psychological models involved here has been provided by A. Newell, J. C. Shaw, and H. A. Simon, of Carnegie Institute of Technology and the Rand Corporation.[1] The significant contributions they have made, very briefly, are these: They have designed a formal computer language in terms of which the elements of a psychological theory may be expressed objectively and precisely. Once set down in this language, the theory may be explored for its implications by running it on a computer.

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[1] Allen Newell, J. C. Shaw, and Herbert A. Simon, "Elements of a Theory of Human Problem Solving." *Psychological Review*, LXV, May 1958, p. 151–166.

After developing this language, Newell, Shaw, and Simon next proceeded to utilize models stated in its terms to study and describe the ways in which humans solve complex problems. Subjects were presented with problem situations and asked to think aloud as they worked. Inferences drawn from what they said and did then were used to sharpen and refine the psychological models. In this way, Newell, Shaw, and Simon succeeded in simulating many aspects of problem-solving behavior, and in a few instances actually were able to reproduce much of the fine structure of the inferred psychological activity over periods as long as half an hour.

Published analyses of this work are available elsewhere.[8] What I would like to do here is to indicate as concretely as possible just what such computer models of psychological processes look like and to suggest in a general way a few of their possible implications for the theory and practice of education.

How is the computer employed in specifying the structure and dynamics of a psychological process? In examining the use made of the computer, we must think of it both as a memory system for *storing* information and also as a processing system for *manipulating* that information. Just as pencil and paper permit us both to store and also to manipulate representations of ideas, so it is with the computer: it serves both as a *medium* and as a *tool*.

In considering the potentialities of the computer as a medium, it is important to avoid imagining that we are dealing with something akin to a cupboard full of numbers. Computer memories are a great deal more flexible, and have actually been used in a very wide variety of ways. White, for example, even includes a description of studies in which computers have been used to store representations of auditory and visual patterns.[9]

The particular organization of computer memory which concerns us here is one which has been utilized in many of the problem-solving systems referred to earlier. Items of information are tied together in the memory in a manner analogous to writing them down on paper and then drawing connecting lines from one item to any others associated with it. The items themselves may stand for anything at all—ideas, concepts, names, or what have you, and they may be moved around and reconnected with one another at our convenience. This organization of computer memory thus is very well suited for representing psychological associations, since the only things that matter are the items themselves and the connections among them.

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[8] For example, Walter R. Reitman, *IRE Transactions of the Professional Group on Human Factors in Electronics, II*, March 1961, p. 27-33.

[9] Benjamin W. White, "Studies of Perception," by H. Borko, ed. In *Computer Applications in the Behavioral Sciences*, Englewood Cliffs, N.J.: Prentice-Hall, 1962.

So much for the computer as a system of memory, holding representations of the information structures we infer from human behavior during complex problems. Let us turn now to the representation of the information processing behavior itself. How are we able to utilize the computer as a tool for manipulating information structures in a fashion which corresponds to the psychological activity going on during problem solving or learning? What kinds of behavioral units are we able to specify? How may we represent the ways in which these behavioral units are integrated into meaningful, goal-directed performances?

To provide a very simple example of the workings of a computer as a manipulator of information structures, perhaps we might consider how a computer could be programed to deal with concept attainment in problems of the sort Bruner, Goodnow, and Austin have used.[*] In their experiments, subjects are presented with a series of cards, one at a time. The cards differ from one another in several attributes, e.g., number of objects on a card, shape of the objects, color of the objects, number of borders around the objects, and so on. A "concept" is defined as a certain set of values on some or all of these attributes. Any card which is a "positive instance" of the concept must contain these values. "Two blue objects" is an example of such a concept. A card showing two blue squares surrounded by two red borders is a positive instance of that concept. A card showing two red triangles surrounded by a single red border is a negative instance, since it does not contain "two blue objects." After each card is presented, the subject is asked to state whether he believes the card to be a positive instance, and he then is told whether it actually is.

Bruner, Goodnow, and Austin describe one strategy, termed the wholist strategy, which some subjects use in trying to attain the concept represented in such a series of cards. It consists of these steps: (1) Begin with a positive instance, that is, a card known to contain all of the values defining the concept, and remember, as your hypothesis about the concept, this card's values on each of the attributes. Thus, if your first positive instance is a card with two blue squares and three red borders, your hypothesis should be that the concept is "two blue squares and three red borders." Change hypotheses only when you come across a *positive infirming* instance, i.e., a card you are told *is* a positive instance of the concept, but which differs from your hypothesis in some respect (thus infirming it). At this point, form a new hypothesis which includes only those values which are common to your previous hypothesis and this positive infirming instance.

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[*] Jerome S. Bruner, Jacqueline J. Goodnow, and George A. Austin, *A Study of Thinking*, New York: John Wiley & Sons, 1956.

The sequence of behaviors a subject might employ in following this strategy may be set down roughly as follows. Assume for simplicity that the first card presented is known to be a positive instance.

1 ——— *Remember* as hypothesis the value of each attribute.
2 ——— *Get* the next instance.
3 ——— *Compare* this instance against the hypothesis to determine whether it is identical, and note any difference.
4 ——— If the instance is identical, do step 2 again; if it is not, do the next step. (This is called a conditional branch.)
5 ——— *Get* feedback indicating whether the card actually is an instance of the concept.
6 ——— If answer is "no," do step 2 again; if "yes," do next step (*conditional branch.*)
7 ——— *Forget* any values of the previous hypothesis which differ from those of this positive informing instance.

Utilizing the formal language Newell, Shaw, and Simon developed,[9] it is almost as easy to program this particular behavioral sequence as it is to set it down in words. And as is evident from this list of steps, the units of the computer's behavior sequence, like those of our hypothetical subject's, will consist of simple basic processes such as *remember*, *get*, *compare*, *forget*, and, of course, *conditional branches* of the form "if this, then do that; if not this, then do the other."

A concrete (if somewhat fanciful) embodiment of such a system may be helpful in visualizing the dynamics of such a program or sequence of behaviors in operation. Imagine a highly bureaucratic office staffed by five clerks. Each is expert at one task and one task only and performs that one task only when told to do so. Clerk Roberts remembers, Gable gets, Coleman compares, Bates branches, and Fox forgets. The office contains files of information (including a file labeled "instances" and another labeled "feedback"), a bulletin board on which temporary information is posted, and a single in-out box in which the clerks leave things for one another. Finally, there also is an executive or control device which may be thought of as a paddle wheel rotated by a protruding handle. The rim of the wheel is concealed behind a cardboard mask containing a window in it just large enough to allow one of the paddles at a time to show through. Fanciful though it may be, this analogy contains all of the functional components we need in order to have the computer simulate the information processing behavior of our hypothetical subject.

To enable this information processing system to solve the concept attainment task of Bruner, Goodnow, and Austin, utilizing the wholist strategy outlined above, we proceed as follows. Next to each number in the list of steps which collectively define the strategy, we write the name of the clerk responsible for the process called for in that step. Now the list is mounted on the rim of the paddle wheel and rotated to the point where the first step number and the name of the clerk responsible for it, Roberts, can be seen in the window.

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[9] Allen Newell, ed., *Information Processing Language—V Manual*, Englewood Cliffs, N.J.: Prentice-Hall, 1961.

Whoever wishes to set this system going may do so simply by ringing a bell attached to the paddle wheel. Hearing the bell, all the clerks look up at the window in the cardboard mask. Roberts sees his name there, gets up, goes to the in-out box, gets the first positive instance (which we assume to be given at the beginning of the problem), and does what he always does—takes whatever is in the in-out box and posts it on the bulletin board. (This action is the functional equivalent of *remembering* for this information processing system.) When he is done, he rotates the paddle wheel one step forward, and then sits down.

When the paddle wheel is rotated, the bell rings automatically. Thus all the clerks now look up once again. Gable sees his name in the window, gets up and walks over to the files, *gets* the next instance, places it in the in-out box, rotates the wheel (thus ringing the bell), and sits down. Now Coleman sees his name in the window, goes over to the in-out box, takes the instance out, walks over to the bulletin board, and *compares* the instance with the hypothesis, detail by detail. If they are identical, he writes "yes" on a slip of paper and puts it in the in-out box; if they are not, he records the differences on the bulletin board, writes "no" on the slip, and puts it in the box. Then he rotates the wheel and sits down.

That brings step 4 and Mr. Bates—the *conditional branch* man. Bates really has a simple job—all he does is rotate the drum, but he alone of all the clerks has the choice of doing it in one of two ways. Bates goes over to the in-out box, picks up the slip of paper there, and consults his data book. In it he finds that at step 4 if the message he gets says "yes" he rotates the wheel back to step 2 (which would bring Mr. Gable up again to *get* the next instance). And if the slip says "no," Mr. Bates' data book tells him that from step 4 he simply rotates the wheel forward to step 5 and sits down.

Let us suppose, to follow our little program through, that the slip said "no" this time. That is, the instance and the hypothesis were not identical. We find the wheel rotated forward, to step 5, and that brings up Mr. Gable again. He *gets* the *feedback*, puts it in the in-out box, and rotates the wheel. This brings back Mr. Bates who picks up the slip, goes to his data book, and finds that for a "no" at step 6 he rotates the wheel back to step 2, and for a "yes" moves it on to step 7.

Let us assume this time that we get a "yes." This brings up Mr. Fox, who consults the list of differences between hypothesis and instance Mr. Coleman so thoughtfully posted on the bulletin board, and then uses this list of differences to modify the hypothesis on the bulletin board, thus eliminating (i.e., *forgetting*, as far as this system is concerned) anything not present in the positive instance which infirmed the hypothesis. The result is a new hypothesis, which is then placed in the in-out box. Now the drum is rotated forward one, bringing us around to the first step again, and we are ready to have another try at the problem, this time with a modified hypothesis.

We have now outlined and demonstrated an information processing program for the wholist strategy described by Bruner and others. With this program, a computer will be able to solve any problem presented to it which in fact is susceptible to such a solution procedure. It is precisely this degree of generality which warrants terming so simple a routine a "strategy." It may be objected that humans are capable of psychological activity a great deal more complex than this. Certainly, it is true that computer models of psychological processes scarcely have begun to probe the range of human capabilities. But those now extant frequently run to many hundreds of times as many steps as the one we have considered here, and the complexities of behavior they already can encompass are correspondingly far greater.

It might also be objected that while all this is very interesting, it hardly seems relevant to what goes on in the head, since after all there are no little clerks running around up in there. Fair enough, but of course there are no little clerks running around in the computer either. And therein lies the whole point of computer simulation models. For when we suggest models of this sort as vehicles for conceptualizing the structure and dynamics of psychological activity, we are asserting only that a *functional similarity* exists between those activities and processes of the sort we have described here. In other words, we are asserting that psychological activity may be viewed and studied as a series of integrated sequences of goal-directed behaviors whose components are simple basic processes such as remembering, getting, comparing, branching, and forgetting. *How* such acts are achieved and integrated in neural tissue is just one of the many important things no one yet knows about neural tissue. When we look at behavior in complex tasks, however, these are the kinds of information handling processes it seems reasonable to infer. And it is just exactly the ability of the computer to *store* extended programs of step-by-step instructions and to *manipulate* these instructions, so as to provide complex yet flexible patterns of information processing, which underlies the claims made by those who contend that the computer will prove to be as important to the understanding of processes at the psychological level as the microscope has been to the understanding of processes at the biological level.

Before moving on to some of the potential implications of these methods for teaching and for educational research, perhaps I might cite just one investigation which exemplifies what can be accomplished with these techniques. We are all familiar with the irregularity, redundancy, and apparent general irrationality of our mother tongue. English has four basic parts of speech where linguists insist two will do; it has an endless proliferation of special syntactic and stylistic rules, and so on. If one takes a Darwinian viewpoint and expects, appearances to the contrary, that our use of language, probably *is* at *some* level economical and efficient in its utilization of human information processing capacities, enabling us to achieve as many of our ends as we can; then one is forced to ask about the kinds of models which might be involved were our expectation to be proven correct.

Victor H. Yngve, of Massachusetts Institute of Technology, has done just exactly this.[6] His investigation of computer models for generating sentences demonstrates that many of the hitherto unexplained redundancies and irregularities of English make sense when viewed in the light of just one limitation on human information processing capacity, the limited extent of immediate memory. These irregularities and redundancies, in other words, are just what it takes to enable us to express thoughts in sentences which otherwise would exceed the immediate memory limit. By utilizing the computer in combination with an interest in the human being as a language-generating organism, Yngve has made a significant contribution to our understanding of the functional significance of the structure of the English language.

I must emphasize that none of the computer models referred to above constitute research on teaching. Their significance for education follows instead from the assumption that better teaching will result from improvements in our understanding of thinking and speech. It may also be of interest, however, to suggest a few potential benefits for education which might follow from future utilization of computers in ways related to those we have described here. These extrapolations take three directions.

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[6] Victor H. Yngve, "A Model and an Hypothesis for Language Structure," *Proceedings of the American Philosophical Society*, CIV, December 1960, p. 444-466.

The first, which has to do with the *content* of what we teach, depends on the fact that an unprogramed computer knows nothing and is capable of nothing. If, for example, we are to develop a system which enables the computer to analyze the interrelations of a string of symbols which make up a statement in a language, then we have to build that system—we have to know everything that is involved in analyzing that string. If we have understood it fully, the computer will testify to our understanding by analyzing the string correctly. If we don't understand it fully, the errors the computer makes will testify to that, too. Thus, in general, this kind of research forces us to develop and refine our own understanding of what we teach, to make our rough notions precise and our intuitive knowledge explicit. The end result is a much better grasp of the structure of our subject matter, much as we might get from writing a really good programed text, but with the added fact that by incorporating our analysis in a computer program, we insure a strict test of its adequacy. If it is anywhere inadequate, the computer will tell us so.

The second point has to do with the teaching process and its improvement. Let us assume for the moment that what we are trying to do when we teach is to encourage the development or employment of some skill or body of knowledge. The fact is that computers programed in the manner described earlier now are providing us with testable models of what goes on when we learn and solve problems.

There are models of how we learn to associate words with things, models of how we comprehend the meanings of sentences, and models of how we solve complex problems in a variety of content areas. As each of these adds its increment to our understanding of the higher mental processes we deal with as teachers, it will improve our ability to devise and evaluate new techniques for teaching and consequently should improve our teaching. Finally, with computer models of the learner at hand, we next may be able to turn to computer models of the teacher and of the teaching process as well. Such models would permit us to test out our ideas about teaching effectiveness in much the same ways we now test out our ideas on learning—by incorporating them in models and running them on the computer.

My third point has to do with the use of computers and computer models by individual schools and teachers. It may seem quite fantastic to suggest that in not too long a time schools will provide teachers with computer assistants, but it is not. Carnegie Institute of Technology already has computers in use in a limited way as teaching adjuncts—as diagnostic and pedagogical devices employed to correct student's problems and thus to provide them with information about what they have done correctly or incorrectly. As technological progress brings down their cost, we are likely to find computers being used at all educational levels as clerical and data processing facilities. As we increasingly become more capable of specifying explicitly the structure of what we are teaching, we may find these same computers, with symbol manipulating programs of the sort discussed above, actually providing instructional assistance of various kinds in the classroom Just as technology has helped to relieve the worker of much physical drudgery, so computer technology thus may free the teacher of much of his clerical drudgery, allowing him to utilize more of his energies and abilities in direct and creative contact with the individual student.

On this visionary note, perhaps I had better end. I want to emphasize again that these contributions of the computer to education are still very much potential rather than actual. But I believe they are there and that, as they increasingly are realized, they will contribute in a major way to the improvement of our understanding of the consequences of what we teach and of how we teach.

Part III: Summaries of the Discussions

THE FOLLOWING summaries are based on stenographic transcripts made of the discussions of the four groups and on the oral reports made by the chairman of each group on the final day of the conference. To be useful, however, these summaries had to do more than simply summarize what was said. As in all discussions of this sort, what was implied was sometimes more important than what was actually said. At other times the discussion followed a particular subject, dropped it, and then returned to it, sometimes leaving a large gap in the line of thought. The connection between the two portions of the discussion, however, was frequently implicit in what was said. Both kinds of implications were made explicit in the summary. Similarly, members of the group sometimes expressed ideas during the discussion which appeared to be perfectly clear to their fellow conferees but which in summary statement often seemed vague. In such instances the summary provides examples not offered in the discussion.

The reader will see that some matters on which research is needed were raised as questions and others as specific research problems. So that what was said in the groups would be distorted as little as possible, the summaries present suggestions for needed research in the form in which they were offered in the discussion: questions as questions, and topics for research as topics for research. The reader can translate from one form to the other, however, very easily. Obviously the person who asks the question "How effective is classroom instruction in the teaching of composition?" is talking about essentially the same kind of study as the person who makes the positive suggestion to "Compare the effectiveness of a course in which students write a theme a week as part of a regular composition class." Thus, although some of the groups seemed to be spending their time more on raising questions than on recommending specific research studies, they were nevertheless carrying out their task; most questions implied a research study—and sometimes several studies.

Some questions did not, however. In a discussion of ways to improve the teaching of English, not all the problems raised can be answered by research. The reader will find, therefore, questions which imply research studies for their solutions, questions which imply surveys (there was some disagreement about whether surveys were "research" or whether only controlled experiments could be so labeled), and questions which demand the making of value judgments. The last kind (for example, "Should literature be used to teach aspects of our culture's morality like honesty?") is sometimes more important than the first two kinds. Controlled experiments cannot answer them. Surveys may tell what other teachers think about them, but asking for a consensus is no substitute for making one's own decision.

Needed Research in the Teaching of the Elementary School Language Arts*

Discussion in this group focused on needed research in three interrelated (and often overlapping) areas: literature (or perhaps more broadly reading), language, and writing. Much of the discussion of language concerned grammar and usage. The primary concern of the group was the small factual base on which much of what we do in these areas is grounded. The group felt that isolated, fragmentary, and often ill-conceived research studies have not advanced greatly the teaching of the English language arts.

The problems in teaching youngsters to read, of course, received considerable attention. At what age, for example, are children ready to learn to read, and how is this reading readiness best determined? Do we simply wait for normal maturation, or can we speed reading readiness? Similarly, how do we make beginning reading enjoyable and challenging? The group was also concerned with whether current approaches to teaching literature develop tastes and appreciation.

A related question arises from current experiments in teaching children in nursery school and kindergarten to read: In the long run what is the effect of such early instruction in reading? Granted that such children will be ahead of the standard reading norms at the end of the first grade, will they continue to be ahead at the end of the second grade . . . the fourth grade . . . the eight grade . . . the twelfth grade? And if so, by how much? If there are real gains in the long run, are there any disadvantages; and how are possible disadvantages to be weighed against the gains?

The problem of how to teach beginning reading also received attention. Since the matter has been under discussion in the profession for many years now, the group defined the problem quickly: phonics, the whole word, or a mix; and if the last, what kind of mix? An associated problem was the relationships between teaching reading by phonics and teaching spelling. The discussion also included questions about the optimum chronological and maturational age for beginning reading and the effects of retarding or accelerating beginning reading.

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*Members of this discussion group were: Sue M. Brett, Richard A. Dershimer, John C. Flanagan, Ann Funk, Lillian L. Gore, Elizabeth Graf, William A. Jenkins (chairman), Bernard J. McCormick, Elizabeth A. McDonald, Ruth G. Strickland, and Kathryn Territo.

Another set of problems dealt with vocabulary. What are the current norms for vocabulary size at the various age or grade levels? Could these realistically be increased? How do we increase or improve vocabulary? What is the relationship between the speaking vocabulary and the reading vocabulary at the various age or grade levels? Some concern was voiced over the wide variations in estimates of children's vocabulary. Experts do not agree either on optimum size of total vocabulary or of specialized vocabularies, or on what we are attempting to develop and for what purpose. A further problem raised was the relationship between the size of vocabulary and other aspects of reading ability.

The group also felt that more information was needed about the relationship between reading speed and comprehension and between the teaching and learning of reading and of speaking, listening, and writing.

Members of the group also raised the question of when the teaching of reading ought to become the teaching of literature. At what chronological or mental age or grade level do we move beyond teaching reading for comprehension to a consideration of the aesthetics of literature, at however rudimentary a level, to a consideration of genres, for example, or to literary analysis? Finally, what is the relative worth of current approaches to literary analysis?

Since many people feel that what children read ought to relate to their own experiences, members of the group felt that it would be useful to have lists of common experiences of children at the various age and grade levels and bibliographies organized according to these experiences and levels. These lists would then be readily available to curriculum specialists and teachers for course and curriculum development and for outside reading lists.

The group also raised the question of the value of reading as vicarious experience. Should everything that children read relate to their own experience? If not, how much should not and how far afield should we go? What do we mean, actually, when we say that what children read should relate to their experience? How much background to a piece of literature should a teacher give to help them understand it?

A similar concern was to what extent literature should be expected to expand students' understanding and their thought and feeling about people. Should it help them to understand people, or is it an end in itself? Need there be any conflict between the study of literature to widen horizons and the study of literature as art form?

Another related concern was whether reading influences behavior and to what extent teachers ought to "prescribe" reading to individual students according to their intellectual and emotional problems. No one in the group used the term "bibliotherapy," but that is what they were talking about. Similarly, to what extent should teachers of English choose literature to foster certain values in individuals and in classes? All sorts of problems arise here. Most teachers would probably agree that we ought to support and even, perhaps, promote honesty, but what of independence of mind or various aspects of morality?

Motivation was also broached as a problem. How do we develop an appreciation of literature in a child? By analysis, by use of a wide variety of readings, by letting the child go wherever his interests lead him? Does a knowledge of genres and technique contribute to appreciation? What is the relation of content to motivation and appreciation? Does the present content, for example, stifle the gifted child or foster in him permanent attitudes and values that carry over into the reading of literature and help him, ultimately, with adult literature? How do age and grade levels affect the answers to these questions?

Mindful of William Riley Parker's oft-repeated and oft-quoted statement that as a teacher of graduate students in English he could not assume "a single book read by everyone in [his] class . . . [or] knowledge of . . . the simplest Bible story or myth or fairy tale or piece of children's literature,"[1] the group raised the question of whether there should be a central body of literature which, among other works, all schools ought to teach. Should the Greek myths be taught, for example, in elementary schools, or the stories of Beowulf, the Cid, or Roland in junior high? Should we brave possible community displeasure and read certain Bible stories? If so, should they all be chosen from the Old Testament, or should some be chosen from the New Testament too? Should all students read certain novels, short stories, poems, essays? If so, which?

The discussions about the teaching of language also included questions of what, how much, and when? Should traditional grammar, structural linguistics, or no grammar be taught? Will generative grammar soon be pressing its claim also? If some system of grammar should be taught, when should it be introduced? What aspects of grammar should be taught at what level? Should usage be taught instead of grammar, in addition to grammar, or not at all?

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[1] William Riley Parker, "The Concept of Structure in English," *The Educational Record*, July 1962, p. 211.

The group also asked whether language studies other than grammar should be undertaken. If so, what and when? Some schools, for example, stress vocabulary building, others semantics, still others the use of the dictionary or the history of the language. A few members of the group were concerned about how best to teach spelling.

Another set of problems concerned where the students learned their speech patterns and when. What are the impacts of home, peer group, and classroom? What was the relationship and difference in effectiveness between simple exposure to language in use and formal classroom study? Why do students imitate the speech patterns of some teachers but not of others? What is the best way to approach standard idiom with children from poor backgrounds? Are the students more ready for exposure to certain patterns or more amenable to adapting certain patterns at certain age or grade levels than at others?

These questions, of course, are as relevant to the problem of teaching writing as they are to the problem of teaching language. They reflect, in fact, the area in which writing and language overlap.

Another set of questions concerned what kind of writing and how much of it students should do. Should it all be based on the students' own experiences? Should it be simply reportorial or should it involve reasoning and imagination? Should writing assignments be all expository, or should they also be narrative? What writing skills should we teach at the elementary level? How frequently and at what length should students write? What factor does motivation play in all of this, and how do we motivate children to want to write well? And, as always, the inevitable complicating variable: how do age and grade level affect these questions?

Also raised as issues for possible examination were such matters as the effectiveness of workbooks; objective versus essay tests; parents' attitudes toward traditional class grouping, traditional classrooms, and traditional grammar, and how they prevent needed changes; the optional class size for teaching literature, composition, various kinds of lessons, and various kinds of concepts; and the proper training for elementary school teachers.

The group also discussed concepts of research. Many felt that what they called "statistical" research was not necessarily the only or even the most important kind of research. Furthermore, others felt that more imaginative research was at least as necessary as better controlled research. Some felt, too, that more research ought to be undertaken as a cooperative venture between people trained in research techniques and classroom teachers, often with the aid of subject-matter specialists from colleges and universities. And others urged more replication of research and parallel research studies for verification of findings. Some suggested that the U.S. Office of Education be urged not only to support specific projects but also to seek out "good people" and provide them with freedom to follow their research interests over a period of time.

Needed Research in the Teaching of Secondary School English*

In this group the discussion focused on needed research in the teaching of literature, language, and writing.

Various aspects of how best to teach literature, of course, were of major concern. One member of the group raised the very basic question of whether the teaching of literature involves any teachable skills beyond ordinary reading skills, and if so what those additional skills are. Another basic question concerned the appropriate level for introducing the various genres as forms and what sequence these introductions ought to follow. A third concerned the various ways of teaching literature and the merits of each. A fourth concerned optimum class size.

One member of the group suggested teaching particular works of literature at several grade levels to determine what students were able to learn about them at different levels. He felt that most topics could be taught at almost any level with integrity and mentioned Jerome Bruner in support of his thesis. Others felt that such a study ought to include the complications caused by differences in students. Thus they wanted to test the impact of a work of literature not only on students of different ages but also of students from various backgrounds: rural and urban, for example or perhaps culturally rich and culturally deprived.

The interrelationship of the teaching of literature and the other matters taught under the rubric of English also was considered. One person suggested teaching literature separately from language, composition, and speech as an experiment; but the recommendation evoked little enthusiasm from the group.

The possibility of a common corpus of literature for study in the secondary school met with considerable enthusiasm. Who should establish this corpus was not discussed (although a sour remark to the effect that what is now being taught is determined by college boards and college entrance requirements suggested that at least one member of the group did not want the new corpus to be set up by testing agencies or college professors or admission officers). The group did not consider, either, what portion of the literature studied by a high school student he should have in common with every other student at his level. There was no suggestion that there ought to be a completely common reading list and identical literature courses in all American high schools. William Riley Parker's complaint that his graduate students knew no single piece of literature or folk lore in common made its appearance in support of some consensus on what students should read in the elementary and secondary schools.

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*Members of this discussion group were: Dwight L. Burton, William H. Cornog (chairman), Stephen A. Dunning, Robert L. Foose, Curtis A. Forehand, Jr., Arno Jewett, C. Albert Koob, Floyd Rinker, John R. Searles, Robert C. Slack, Ruth S. Stickle, and Marian Zollinger.

The discussions of the teaching of language related largely to the matter of readiness. What, for example, the group wanted to know, are the variations in the ability to use language at the various age levels? At what age are students ready for particular linguistic concepts, for training in organization, for discussions of logic?

Similarly, a major concern with grammar was when it should be taught, how often, and in classes of what size. The group also raised the question of what grammar to teach and what effect, if any, the teaching of grammar has on the students' ability to read, write, and speak.

One of the questions raised repeatedly about the teaching of writing was how important it is to have students write. Several people suggested that the importance of practice should be evaluated. Others, evidently assuming that some writing was useful, asked about optimum frequency of writing assignments. Another suggested a study to see whether intensive reading of "good literature" (under proper guidance, of course) might be as effective in the teaching of writing as intensive practice in writing.

A similar question was the relation of writing ability to reading ability. Others asked about the relation of language study to writing ability and the relation of the study of logic to writing ability.

Another group wanted information on the value of conferences in teaching writing. Are they helpful? Do they vary in effectiveness with different kinds of youngsters and at different age and grade levels? A related question was the importance of class size in teaching composition.

Members of the group also suggested several interesting surveys. How many people, for example, really need to know how to write a coherent paragraph in order to function adequately on the job or in private life? How do good writers become good writers? Someone suggested locating some good writers and finding out. The group also wanted to know whether there are different kinds of writing appropriate to a particular age or grade level at different levels of intelligence.

Another group of questions related to motivation. How should we motivate students in the English classroom? Should we have special programs for the slow learners? Would identifying potential dropouts and giving them special programs keep more of them in school? What is the relationship between poor reading ability and dropout and delinquency? How do we overcome cultural deprivation?

There was considerable insistence on the importance of clearly defined goals. The more explicit a hypothesis is, the more easily it can be tested; and good, clear objectives allow results to be evaluated more carefully. Furthermore, a clear statement of goals helps teachers to know what they are aiming for. The group agreed, however, that even when goals are clear it is difficult to evaluate a student's response to literature, his understanding of language, or his ability to write. It felt, therefore, that it is the responsibility of the profession to attempt to improve methods of evaluation; and it looked forward hopefully to aid from an increasingly more mature and sophisticated psychology.

The group proposed 10 specific matters for investigation:

1. Build and evaluate an integrated English curriculum for grades 9 through 12 which gives equal time to literature, language, and composition. The new curriculum would be prepared by a group of specialists in various areas and its effectiveness would be measured against that of various "traditional" English curriculums. Additional variables to be measured should be differing levels of ability and motivation and different kinds of communities (i.e., urban, suburban, rural).

2. Build and compare the effectiveness of two courses, one using a logical or hierarchical organization of material, the other a spiral order. Both courses would use the same materials; only the organization of the materials would differ. (The ultimate goal here is to determine the proper sequence, if any, in which to teach the various concepts and skills in the study of literature, language, and composition.)

3. Test the four suggestions for teaching language contained in the paper by W. Nelson Francis (on grammar, word study, usage, and the history of the English language) in classes using the language materials prepared in the summer workshops sponsored by the Commission on English of the College Entrance Examination Board. Unless it is desirable to devise special tests, use standardized tests now available to measure proficiency in spelling, usage, vocabulary, sentence construction, and other language skills.

4. Evaluate summer institutes held for English teachers to determine: (a) the attitude of those who attended, (b) the changes they instituted in the content of their own classes as a result of their attendance, (c) the innovations in their teaching methods which resulted from their attendance, and (d) their influence on their fellow teachers. This information should

be used in planning future summer institutes. (The CEEB Institutes of 1962 are, in fact, being evaluated by a team financed by Project English.)

5. Study potential drop-outs to determine how course content and teaching method may be replanned to meet their needs and arouse their interests to make them aware of the value of the study of English.
6. Study the use of audiovisual aids, field trips, and other devices to motivate the student uninterested in English.
7. Isolate and identify specific writing skills and determine how they can best be taught.
8. Investigate the relationship of performance in understanding and analyzing literature and in writing with various styles of thinking as identified by psychological tests.
9. Measure the effectiveness in the teaching of writing of conferences between the teacher and the student. Such variables as optimum length of conferences and different conference procedures should also be tested.
10. Compare the influence on the improvement of student writing of much reading and little writing, balanced reading and writing, and much writing and little reading.

Needed Research in the Teaching of College English*

Discussion in the college group focused on four areas of needed research: the teaching of writing, language, and literature; and general professional and curricular problems.

In its discussion of writing, the group raised several questions which could be answered by surveys and analyses. What are the differences, for example, between the kinds of writing asked of the college student and the kinds asked of the high school student? What level of writing can the junior high school student, the high school student, and the college student be expected to do? What kind of writing does the ordinary citizen do in his business or professional life and in his private life? Do people tend to speak more easily and more competently than they write, and if so, why?

Another series of questions suggest research studies to determine the most useful content of composition courses. Should the course contain readings? If so, should they be literary, expository, or both? If expository, what should they be about: the nature of language, the history of the language, sociology, psychology, the communication process? What is the effect of knowledge of the structure of language, traditional grammar, and rhetoric on one's ability to write? Feeling that knowledge of grammar does influence the ability to write but that perhaps a conscious attempt to relate the two is the wrong approach, one member of the group suggested a comparative study of the teaching of writing to three groups of students: a group in which grammar is taught as an aid to help them write better; a group in which grammar is taught as a humanistic and cultural subject with no specific relation to writing; and a group in which no grammar is taught.

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*Members of this discussion group were: Wayne C. Booth, Paul B. Diederich, John S. Diekhoff, John H. Fisher, W. Nelson Francis, Walker Gibson, Jean H. Hagstrum, Robert B. Heilman, W. J. McKeachie, James E. Miller, Jr. (chairman), Chester L. Neudling, Robert W. Rogers, and Erwin R. Steinberg.

Another set of questions suggested studies in the methods of teaching composition. What would be the difference in the writing ability between a group of students who take no course in composition but write in all their other courses and a group who take a composition course but do no writing at all in other courses (i.e., have only "objective" tests)? How would the writing ability of a group of students who write regularly and attend classes in composition compare with that of a group that do the same reading and have the same writing assignments but have no classes in composition? What would be the effectiveness of having the instructor read and discuss students' papers with them in individual conferences rather than reading and marking them up privately? Would students learn to write better if writing instruction were freed of its negative aspects: proscription and correction? Can we develop methods of teaching a student to write without the aid of a teacher?

A question which recurred in several forms was whether teachers would be able to teach writing better if they themselves were better writers? Should teacher trainees in English at the undergraduate level take a course in advanced composition? Should graduate students in English be required to take a writing course? Another recurring question concerns the establishment of criteria for evaluating writing. Members of the group pointed out that so long as we cannot agree regularly on what is a good piece of writing and what is a poor one, it would be difficult to set up research projects that would give us meaningful answers to any of our questions.

In its final report the group recommended a series of what it felt to be important projects and research studies on writing:

1. Develop courses for would-be college teachers which would teach them not only how to write but also how to teach writing.
2. Establish an advisory committee of highly competent professional writers to work with college professors of English on composition courses and programs.
3. Compare the effectiveness of highly structured and highly permissive courses in composition: a course with carefully worked-out sequential assignments compared with a course in which the students are simply told to write.

4. Compare the effectiveness of a course in which the students write a theme a week but do not attend any class with a course in which the students write a theme as part of a regular composition class.
5. Compare the writing ability of a group of students who do not take a course in composition but write frequently in all of their other courses with the writing ability of a group who take a composition course in which they write regularly but who do not write at all in their other courses.
6. Determine the relative effectiveness of the instructor's evaluating a student's theme in conference with the student and his correcting it privately.
7. Determine the relative usefulness of linguistics, traditional grammar, and rhetoric, and of literature and composition as content for composition courses.
8. Develop methods of teaching writing without the use of a teacher.

In its discussion of language, the group distinguished between two kinds of needed research: basic and applied. They felt that we need basic information about language as well as information about how to teach language. We need to know, for example, more about current usage—at all levels—than we do now. We need to know more about the relationship between written and spoken English, in general and for particular individuals. We need also to know such things as whether the greater redundancy of spoken English is necessary for oral communication (so that a listener can follow), or whether it is actually necessary.

The questions suggesting applied research are also important. Does a child's enthusiasm for experimenting with language disappear as a result of biological maturing? Or does school or our society discourage it? Is linguistics relevant to the teaching of literature? Could we set up projects in which linguists would develop materials for teaching language in the elementary and secondary schools? At what grade level can we undertake serious study of the dictionary? In teaching language, are there any advantages to stressing the standard form rather than discouraging the substandard, i.e., telling the student not to use the wrong form? What is the best way to teach spelling? Some spelling errors are phonetic. Others suggest a disordered total impression of a word. Are these valid categories of misspellings? Are there others? Would categorizing the causes of misspellings help us to learn how to overcome the various difficulties?

The group recommended the undertaking of several specific research studies in this area:

1. Develop adequate descriptions of the grammars of spoken and written English at the various levels of usage (the group felt that the computer would be useful in this undertaking).

2. Develop a new, linguistically sound, spelling system.
3. Determine the causes of spelling errors.
4. Develop materials for teaching various aspects of language at appropriate levels: (a) the dictionary: its history, philosophy, and use; (b) English grammar; (c) linguistic materials for the teaching of prose and poetry; (d) the history of the English language; (e) the nature of language; and (f) regional dialects.

The discussions of literature were colored by an uneasiness that many people do not realize that the study of literature is central to everything normally included under the study of English. For example, since the study of literature reveals the accomplished use of writing—writing at its most suggestive, most flexible, most communicative—it offers a friutful approach to the study of language. Members of the group expressed concern that it appears easier to obtain support for studies of the teaching of reading, language, and writing than for studies of the teaching of literature.

An important question about the teaching of literature was the exact function of usefulness of literature in teaching reading and writing. Other questions concerned the proper time to introduce literary criticism and theory and the appropriate grade level to introduce specific works of literature. Another group of questions involved methods of teaching literature: the merits of large group instruction compared to small group instruction compared to one large lecture plus several recitation classes a week; and the value of independent study compared to classroom study.

The specific recommendations for studies in the teaching of literature were:

1. Prepare new materials for humanities courses being taught in high school and college—particularly translations of foreign literature.
2. Develop programs for more effective use of paperbound books in high school and college.
3. Develop methods of preparing valid examinations in literature.
4. Prepare sequential reading lists for various age and grade levels and for students of different intelligence and background through the M.A. and the Ph. D. (Here again reference was made to William Riley Parker's complaint about the lack of common literary experience of his graduate students.)
5. Develop microfilm libraries and information retrieval systems for small institutions with graduate programs.

The professional problems the group discussed concerned largely the preparation of teachers. Although the preparation of public school teachers was a matter of concern, the group gave most of their attention to the preparation of college teachers of English. They discussed an intermediate degree between the M.A. and the Ph. D., to be awarded after completion of graduate course work, but before the undertaking of the thesis. Suggested names for the degree were Graduate in Arts or Literature and Doctor in Arts or Literature. Holders of such a degree, members of the group felt, might be awarded a Ph. D. on completion of a thesis or similar major research undertaking.

Other discussions concerned a Ph. D. in the teaching of English to be awarded by departments of English rather than schools of education. Such a degree would include a minimum number of education courses and a thesis on some problem in the teaching of English. Candidates for the degree would be experienced high school teachers. Hopefully, these people would return to the secondary schools as department heads, curriculum specialists, and supervisors. Some might qualify as teachers of the methods courses which are increasingly being offered by members of English departments or by holders of joint appointments in English education. A similar degree for people interested primarily in teaching college composition and in teaching in junior colleges was also discussed.

The group also discussed the shock students experience moving from high school to college English. Is there a shock? Is it good or bad? Are there different kinds of shock? What is the relationship between such a shock and the ritual signifying the passage from one important phase of a person's life to another?

Another matter discussed that concerned the determination and marking of the end of a phase was the professional examination. Should there be such an examination in English? Who should make it up? What should go into it and in what proportion? Should it be administered the way the bar examinations and medical boards are? Would such an examination be useful in screening candidates for graduate school?

Under professional problems the group recommended a series of studies:

1. Develop a professional examination in English.
2. Develop examinations that will predict good English teachers and candidates for graduate degrees in English.
3. Devise a plan for recruiting teachers of English at all levels.
4. Develop a new degree which would fall between the M.A. and the Ph. D.: the Graduate in Arts or Literature; or the Doctor of Arts or Literature.
5. Develop a new Ph. D. in the teaching of English to be offered by departments of English.

The group also discussed some general problems about research in the teaching of English. They wondered whether all aspects of it are testable and if not, which are and which are not. They asked for clear statements of what research in this area had already been undertaken and an indication of which studies show clear, persuasive results and which, tenuous. They called for continued submission of teaching problems to reason, common sense, and imagination, as well as to controlled experimentation. And they urged that organizations sponsoring research and development find competent people and relieve them of the routine of much of what they are doing so that they may undertake the needed research and the development of useful, imaginative teaching materials.

Needed "Multilevel" Research in the Teaching of English*

This group was concerned primarily with conceiving a meaningful framework within which they could discuss: the wellsprings of research; research itself, both basic and applied; the synthesis of research studies and their subsequent use.

Research is a tool for verifying assumptions. As such, it follows the development of theories and the translating of theories into teaching practices. Good research, of course, does more than verify assumptions; it adds to the dimensions of theory by pointing out new channels of inquiry; it feeds back into the teaching process data that can reshape that process. Nevertheless, research is but one phase of a total intellectual movement. And the quality of educational research is dependent upon scholarship, creative thinking, and teaching which generate researchable questions.

For this reason, the group directed their thinking not only to research itself but to the antecedents and consequences of research. They saw needed research deriving from scholarly inquiry in many disciplines, from a synthesis of existing research and scholarship, and from experiences in teaching.

As one way of promoting scholarly inquiry into the nature and use of language, this group recommended a series of seminars which would bring together representatives of academic disciplines, such as the behavioral sciences, philosophy, liguistics, and foreign language teaching, and representatives of nonacademic groups such as professional writers and specialists in industrial research. Such interdisciplinary seminars would help to establish a discipline called language that can be consistently maintained from kindergarten through teacher education. Out of such scholarly inquiry would also come direction for relating the learning and teaching of language to the current culture and for enabling teachers of language to effect cultural change. A third result of this type of seminar would be the establishment of criteria for curriculum development. Related to these seminars would be studies to determine principles of selection of content in the teaching of language, literature, and composition.

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*Members of this discussion group were: Harry A. Becker, Max Bogart, Margaret J. Early (chairman), Walter Eddington, James R. Green, George H. Henry, J. N. Hook, Francis A. J. Ianni, Mary H. Maher, Agnes McElwee, Paul A. Olson, Walter R. Reitman, James R. Squire, and Priscilla Tyler.

The second source of needed research discussed by this group was accumulated knowledge from past research and scholarship. Before this knowledge can be readily used, it must be synthesized by means of projects such as the investigation of reading research by the U.S. Office of Education and the reviews of research in various aspects of English teaching currently being sponsored by Project English. In the future, documentation centers will expedite syntheses of this kind. The group asked for speedier development of methods of coding and abstracting research for ready retrieval.

As another means of improving the quality of future research, this group recommended two types of seminars. One would be designed for those who direct research studies and need to be brought up to date on research techniques. Another would be aimed at persons who interpret the results of research to classroom teachers.

Still another way of determining directions for future research is to examine the implications of current investigations. The group recommended that the U.S. Office of Education and other sponsoring agents, such as the Carnegie Corporation and Ford Foundation, conduct seminars in which specific studies would be examined closely by experts in research design, who would test the soundness of the findings and conclusions of the investigators. From such investigations should come implications for further research or, just as important, the redirection of effort.

The third aspect of research considered by the group was application. In demonstration centers, the theories and research findings of scholars and teachers, pooled from several sources (including the interdisciplinary seminars mentioned previously), could be translated into teaching practices and materials. In such centers, also, the assumptions to be tested by research would be refined. Not only would these centers generate needed research; they would demonstrate the application of research findings to teaching in classroom settings. They would thus perform a vital service in teacher education. Demonstration centers, then, would be another means of making research consequential.

Similarly, many of the problems discussed by the group might best be explored in demonstration situations. For example, there was the question of staffing and the best use of master teachers and reading specialists. There was also the question of grouping students for instruction. Many participants felt that moving students through elementary and secondary school largely according to their age without regard to their ability had imposed an unfortunately rigid pattern on our educational system and wondered whether experimentation with homogeneous grouping and moving individuals ahead at their own speed would help to develop more flexible patterns and sequences. They asked for the development of special curriculums in English for the slow learner, for the fast learner, and for the student for whom high school was the terminal educational experience.

A pressing problem recognized by this discussion group was the fragmentary nature of research as it now exists. To prevent continued fragmentation, the group saw the need for a framework within which the results of past, present, and future research studies could be related and made meaningful. They proposed that questions relating to the teaching of English at every level could be seen in their interrelationships if placed in a framework of three dimensions: language patterns, the manipulation of these patterns in modern discourse (communication), and the manipulation of these patterns in aesthetic forms (literature). This framework would accommodate studies of the language in the three dimensions indicated, of the learner as he develops in these dimensions, and of teaching methods and evaluation. It was suggested that such a framework would be useful to persons who synthesize and interpret research findings; to persons responsible for initiating and executing studies within a cooperative research design; and to persons in groups like the one being reported on here, whose purpose is to examine the relationships of research to problems confronting English teachers.

To test the efficacy of the proposed framework, the group developed a set of questions that relate to language patterns as they appear in individual learners. What, for example, are the stages of development in the individual of increasingly complex language patterns and vocabularies? What is the order of development of language patterns and vocabularies in spoken English? What is the order of development in written English? What is the frequency of patterns at the various stages? What is the relationship between oral and written patterns? How does language development differ as a result of subculture or intelligence?

A second set of questions related the use of these patterns and certain mental processes at the various levels to oral and written discourse. At what rate and through what stages does an individual develop a sense of logic, a sense of causality, a sense of particulars and

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generalizations, a sense of time and space; and what effect does this development have in its various stages on the individual's ability to communicate orally and in writing? At what rate and through what stages does an individual's value system develop, and what effect does that development have on his ability to communicate? Are there certain levels at which students respond most favorably to instruction in writing which emphasizes subject matter? Are there levels at which use of models produces the best results in students' writing? Are there other levels at which students respond best to opportunities to write about themselves?

A third set of questions related the use of various language patterns and certain mental processes at the various stages to the understanding of literature and literary forms. How does the individual perceive the world and represent it to himself in the various stages of his growing up and what kinds of literature correspond with those perceptions? What is the relationship between the ability to perceive abstract form and the ability to perceive literary form? What sequence of interests in form do individuals go through? In what steps does a child develop a sense of individualization and classification and how do these relate to the ability to perceive literary form? How does literature relate to the dramatic sense of the child at various stages? What kinds of literature does a child read spontaneously at various ages, and how can we use this literature at the various levels to relate him to the general tradition of human culture? What are the stages of the development of the capacity in an individual to perceive in literature symbolic or allegorical statements which are not on the surface of the work?

A further dimension of research is the interaction of our culture and subcultures with all of these problems. What is the role of literature in our culture? What is the effect on the teaching of literature of the change of the function of literature in our society? Until as late as the eighteenth century, it was generally accepted that literature should play the role of celebrant and critic of life. How has the displacement of literature from this role affected the teaching of it? What are the literary needs and achievements of our culture? Why are men in our culture not supposed to like literature? Would they respond to it more favorably if more English teachers were men? What particular usage patterns develop in various social and economic subcultures in this country and how do these relate to the teaching of language, writing, and literature? To what extent are forces in our society destroying these subcultures, and if this destruction is going on, does it posit the teaching of a standard middle-class culture and language? What skills in the language arts do people in our culture need in order to operate effectively? Should we cater only to what people need to know, or do we have further responsibilities? What can best be taught in school and what can best be taught by the culture? How do we handle a conflict between the teaching of the school and the teaching of a subculture?

The group was also concerned about possible conflicts between various kinds of structures or patterns involved in the teaching of English. The English language, for example, has certain patterns. A child learns these patterns in certain sequences. There are also certain patterns of learning most profitable in group instruction. How do these three sets of patterns, these structures, interrelate—coincide or conflict; and what are the implications of this interrelationship for the teaching of English? Should, for example, the structure of the English language dictate the structure of the teaching of the language?

A similar set of questions may be asked about literature. There are various patterns, for example, in the corpus of English, American, and world literature: literary periods, genres, themes, etc. There are also certain patterns and sequences in the intellectual and emotional development of the child. And, again, there are certain patterns of learning most profitable in group instruction. How do these three structures interrelate; and what are the implications of this interrelationship?

Much of this concern with structure stems from Jerome Bruner's demonstration of the importance of structure in the teaching of mathematics and science. The question for teachers of English is whether structure is equally important in the teaching of language and literature.

In their discussion of reading, members of the group suggested that demonstration projects to acquaint English teachers with problems and methods of teaching reading would be profitable. They also pointed to the need for interpreting to teachers research studies on the relationship of family background, personality, mental ability, experience, and speaking vocabulary to the teaching of reading. When the question of self-selection of reading materials was raised, members of the group asked to what extent students should determine their own reading material and what light their selection of reading threw on their writing problems.

Several questions about writing in addition to the ones reported so far were also raised. There was, of course, inevitably and repeatedly the question of whether a knowledge of grammar was useful either to the teacher or the student in the teaching of writing, and if so, how. And there was a related suggestion that a comparative study be made of the relative usefulness in the teaching of writing of traditional, structural, and generative grammar. One member of the group asked what could be done about the many English teachers who encourage dishonest use of language in their students' writing: overblown, pretentious phraseology that he characterized as "high-falutin."

This last problem raises questions about the inservice training of teachers and about the preparation of teachers. The group asked, for example, how many English teachers like to write and how many write well. Some wondered also about how many English teachers really like literature. The question of large classes and heavy loads come up repeatedly and led members of the group to wonder to what extent these things kept good people out of teaching or drove them out of teaching once they were in it. Similarly, they wondered to what extent heavy loads kept English teachers from reading literature and keeping up with professional developments. The group discussed methods of improving communication among teachers, of creating among them some sense of intellectual community, and of imbuing them with a greater sense of intellectual responsibility. All of these questions led inevitably to the suggestion of a study of the effect on teachers of a reduced load. They also led to suggestions for demonstrations of effective methods of inservice training.

Since many of the members felt that often there was little relation between college training and what teachers need to know, they asked what could be done to help would-be teachers to adapt what they were learning in college to their future needs. And they asked for exploration of the question of whether English teachers at all levels should receive the same training in language or whether English teachers at the various levels (elementary, junior high, high school, and college) should receive different training.

Part IV. Conclusion

DURING the concluding discussion, the conferees agreed that they had failed in one of the stated objectives of their meeting: assigning priorities to the research problems they accumulated. A reading of the papers and of the summaries of the discussions, however, shows that in fact they did not fail. Simple frequency of mention indicates that the speakers and their fellow conferees felt some problems to be of greater importance than others.

The problem which was mentioned most often in the papers and discussion groups and on which the conferees probably spent more discussion time than any others was the effective use of language. The first question was whether grammar should be taught at all and, if so, which grammar: traditional, structural, generative, or some synthesis of all three. The next question was the relevance of grammar in one form or another to the teaching of writing. Research suggests strongly that there is little correlation between an understanding of grammar and the ability to write well. The conferees—expressing the attitude of most of the profession—seemed reluctant to accept that idea. In this instance, research and the collective experience of the profession seem to be at odds; the teacher of English is faced with the apparently contradictory facts that whereas research seems to show that a knowledge of grammatical concepts and terminology is not important for one to be able to write well, experience seems to show that some minimum knowledge of that terminology is necessary to communication about writing problems. Perhaps, however, the two facts are not really contradictory. Continued exploration of the problem may suggest not only a different interpretation of available research but also further research which would be more profitable.

A further question is whether, even if research demonstrates unquestionably that the technique of grammatical analysis is absolutely useless in the teaching of writing, students ought not to know how their language "works" simply because it is their language. If, as the linguists tell us, we all "know" the grammar of our language intuitively, should not that knowledge be made conscious and be formalized? The decision on such questions, however, cannot come from research. The profession will simply have to make them. And if, as is likely, the profession decides that an adequate education includes an understanding of the patterns of language, we find ourselves back where we started: which grammar—traditional, structural, generative, or some combination of the three? To that question research should be able to help provide an answer.

The second problem to which by frequency of mention the conference assigned a high priority concerned the structure and sequence of courses: the best times to introduce various concepts of language, literature, and communication, and the levels at which one could reasonably expect students to perform certain tasks. There seemed to be two reasons for the major concern here. First, Jerome Bruner's *The Process of Education*[1] with its emphasis on structure, has had a great impact on teachers at all levels. One would expect teachers to be predisposed to order, so it is not difficult to see why many of them would be sympathetic to Bruner's thesis, even if implicit in its acceptance is the fact that they will have to reevaluate and reorganize most of what they have been doing.

A second reason for the concern with sequence may have been the current pressure to make the educational process more challenging, particularly for the able student. People are asking today why children can't be taught to read before the first grade and why students take "reading" through sixth grade but must wait to study "literature" until junior or even senior high school. It is understandable, then, for teachers to ask what the best age or ability level is to teach beginning reading and to introduce literature. Any readjusting of the teaching skills and concepts to different levels from those at which they are currently being taught inevitably raises the question of sequence.

One serious concern that recurred in the discussions was whether the structure and sequence inherent in a subject might conflict with the structure and sequence inherent in the maturation of the student. Fortunately for the solution to this problem, research should be able to provide enough information about both kinds of structure and sequence to enable us to answer that question and solve whatever problems are inherent in it.

A third problem of high priority to the conferees, particularly in their discussions, was the relation of what is taught in the school to the subculture from which the student comes. They were concerned not only about the problems caused by the culturally deprived students but also by those caused by the culturally advantaged. They felt that teaching methods ought to be adjusted more to the background and needs of the students and wondered to what extent content ought similarly to be adjusted. The complications here arise from the fact that such adjustment may well result in different qualities of education for different groups in our society. It is difficult to see whether there is any solution to this problem or, if there is, how research can help to determine that solution. It is when a group arrives at the crux of such a dilemma that one usually hears the plea for more imaginative research studies.

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[1] Jerome Bruner. *The Process of Education.* Cambridge, Massachusetts: Harvard University Press, 1960.

By their frequency of discussing them, then, the conferees assigned highest priorities to research problems concerning: Methods and techniques for the effective teaching of language; the structure and sequence inherent on the one hand in various subject matters and skills and on the other in the maturing intelligence and abilities of the student—and their interrelationships; and the importance of our culture and its subcultures to what happens in the English classroom.

Of perhaps equal interest are the matters to which the conference might have been expected to pay particular attention but did not. There was little attention shown, for example, to the problem of large versus small group instruction and to the related matter of team teaching. Large enrollments will soon force major decisions about the former of those questions, and experiments of some magnitude are under way on the latter; yet the conferees referred to them only occasionally. Similarly, little or no mention was made of devices for teaching large groups: television, film, and the overhead projector. The conferees also had little or nothing to say about programed learning.

It may be that the papers determined what went on in the discussion groups. A paper specifically on team teaching, on the newer audiovisual aids, or on programed learning might have focused the conferees' attention more clearly on those matters. Yet Paul Diederich's specific treatment of lay readers in his paper brought forth no discussion of corresponding importance in the group. Furthermore, the conferees were sophisticated enough and familiar enough with both the needs of the profession and current experiments not to find necessary specific invitations to consider important problems.

A reconsideration of the transcripts of the discussions, summarized above, and of the papers suggests that the conferees limited their considerations to the most basic problems facing English teachers at the various levels. Whether one faces one's students in the classroom or appears before them on a television screen or gives them instead a programed text or a teaching machine, one must decide first which grammar to teach or the proper sequence in which to expose the student to various aspects of language or literature. Consciously or not, the conferees seem to have limited their discussion very strictly to the announced topic of the conference—needed research in the teaching of English—and reserved for conferences of the larger profession matters that were of concern to all teachers.

Throughout the three days, the speakers and their fellow conferees addressed themselves also to more general considerations of research: its usefulness, what sort of answers it could and could not provide, and what its dangers were. The specialists in English subject-matter and education expressed concern that too frequently insistence on controlled research lead to preoccupation with matters of little importance, since these frequently lend themselves more readily to experimentation than do many of the major problems. There was general agreement, too, that some questions could not be solved by research and that the profession must use other means of resolving them.

For their part the psychologists in attendance were quite modest in their claims for research and their own abilities. One insisted that the English teachers would have to play a major part in any research, that objectives to be tested had to be determined by specialists in English before the psychologists could be helpful. Another kept repeating that the most likely result of any piece of research was "no significant difference." A third psychologist acknowledged that "the state of the art" needed considerable improvement. And another cautioned his audience not to hope for too much from massive experiments and huge accumulations of data; he advised them to "think small" rather than "think big." If there was any fear at the opening session among the conferees from English and English education that their discipline was in danger of being mutilated to suit the measure of a Procrustean bed of statistics and experimental controls, they appeared not to have that fear at the closing session. Indeed, a suggestion that similar conferences in the future have more social scientists in attendance—sociologists and, perhaps, anthropologists, for example—met with no objection.

To their credit, to balance their questioning attitude toward the psychologists, the specialists in English and English education were often irreverent toward some of the major assumptions held by the members of their profession. Without necessarily denying them, they asked that many such assumptions be put to the test: the assumption, for example, that it is necessary for a student to write frequently for him to learn to write well; or the assumption that a student need attend a classroom presided over by a teacher in order to learn to write well. They challenged even more strenuously the insistence that the profession continue to offer only the traditional Ph. D. and that all needs be made subservient to its requirements. They were very much aware that Procrustes' name is legion and that he could as easily appear in the hood and gown of the specialist in Engish as of the psychologist.

They showed a proper balance in their discussion of other problems, too. On the one hand they insisted that the profession as a whole was going to have to take a much greater and more sympathetic interest in research in the teaching of English than it has in the past and that many individuals in the profession were going to have to devote their time to such research. On the other hand, they agreed that, if one expected a teacher of English to be a competent critic or to do research in English, one could hardly expect him also to be competent in experimental design and psychometrics. One solution seemed to be annotated bibliographies of the best discussions of experimental research and of the best examples of such research which could be made available to specialists in English and English education. An additional suggestion was more and better systems for information retrieval and broadcasting. Another was team research in which specialists in English, English education, and psychology and measurement pooled their abilities and their knowledge. And still another was to encourage English departments to offer as great rewards for research in the teaching of English as they do for research in language or literature.

In their final session, the conferees felt that the conference had been profitable. They did, however, have several suggestions for the improvement of similar conferences held in the future. Their biggest objection to the conference was that they were too pressed for time. The leaders of a future conference, someone suggested, might experiment with distributing the papers in advance and then either expect the conferees to have read them or ask the authors to deliver them. Many of the conferees also felt that the conference should have extended over a longer period. In response to a question from the floor about matters within the purview of his group about which he had nothing to say, one chairman replied, "We simply ran out of time. We took up as many problems as we could." The listing and discussion of needed research, it seems, was not concluded as much as stopped. Many conferees also felt that conference programs should not be scheduled through the evening because such regimentation precluded valuable informal discussion in other than conference groupings. They argued that discussion in permanent groups could become quite sterile without the stimulation of an exchange of ideas among members of different groups. (All of this suggests, perhaps, that we need some research on how best to structure a research conference!)

Whatever questions they raised about the teaching of English or about the conference, however, and whatever research studies they recommended, most of the conferees shared a common set of attitudes: they recognized generally that research conferences were profitable, that asking was the first step toward finding, and that identifying problems was vital to solving them.

APPENDIX

List of Conferees

Becker, Harry A., *Norwalk, Conn., Public Schools*

Bogart, Max, *New Jersey Department of Education, Trenton*

Booth, Wayne C., *Earlham College, Richmond, Ind.*

Brett, Sue M., *U.S. Office of Education*

Burton, Dwight L., *Florida State Univ., Tallahassee*

Cornog, William H., *New Trier High School, Winnetka, Ill.*

Dershimer, Richard A., *Pennsylvania Department of Public Instruction, Harrisburg*

Diederich, Paul B., *Educational Testing Service, Princeton, N.J.*

Diekhoff, John S., *Western Reserve Univ., Cleveland, Ohio*

Dunning, Stephen A., *Duke Univ., Durham, N.C.*

Early, Margaret J., *Syracuse Univ., N.Y.*

Eddington, Walter, *New York State Department of Education, Albany*

Fisher, John H., *Indiana Univ., Bloomington; Modern Language Association*

Flanagan, John C., *American Institute for Research, Pittsburgh, Pa.*

Foose, Robert L., *Westfield, N.J., High School*

Forehand, Garlie A., *Univ. of Chicago, Ill.*

Francis, W. Nelson, *Brown Univ., Providence, R.I.*

Funk, Ann, *Pennsylvania State Univ., University Park*

Gibson, Walker, *New York Univ., New York, N.Y.*

Gore, Lillian L., *U.S. Office of Education*

Graf, Elizabeth, *Pittsburgh, Pa., Board of Public Education*

Green, James R., *Indiana, Pa., State College*

Hagstrum, Jean H., *Northwestern Univ., Evanston, Ill.*

Heilman, Robert B., *Univ. of Washington, Seattle*

Henry, George H., *Univ. of Delaware, Newark*

Hook, J. N., *U.S. Office of Education*

Ianni, Francis A. J., *U.S. Office of Education*

Jenkins, William A., *Univ. of Wisconsin, Milwaukee*

Jewett, Arno, *U.S. Office of Education*

Koob, C. Albert, *National Catholic Education Association, Washington, D.C.*

Mahar, Mary H., *U.S. Office of Education*

McCormick, Bernard J., *Taylor Allderdice High School, Pittsburgh, Pa.*

McDonald, Elizabeth A., *Linden School, Pittsburgh, Pa.*

McElwee, Agnes R., *Pennsylvania State Univ., University Park*

McKeachie, W. J., *Univ. of Michigan, Ann Arbor*

Miller, James E., *Univ. of Nebraska, Lincoln*

Neudling, Chester L., *U.S. Office of Education*

Olson, Paul A., *Univ. of Nebraska, Lincoln*

Reitman, Walter R., *Carnegie Institute of Technology, Pittsburgh, Pa.*

Rinker, Floyd, *Commission on English, Boston, Mass.*

Rogers, Robert W., *Univ. of Illinois, Urbana*

Searles, John R., *Univ. of Wisconsin, Madison*

Slack, Robert C., *Carnegie Institute of Technology, Pittsburgh, Pa.*

Squire, James R., *Univ. of Illinois, Urbana; National Council of Teachers of English*

Steinberg, Erwin R., *Carnegie Institute of Technology, Pittsburgh, Pa.*

Stickle, Ruth S., *East Leyden High School, Franklin Park, Ill.*

Strickland, Ruth G., *Univ. of Indiana, Bloomington*

Territo, Kathryn, *Waterford School, Oaklyn, N.J.*

Tyler, Priscilla, *Harvard University, Cambridge, Mass.*